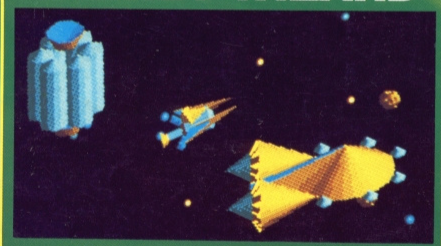
ISSUE 3 • SEPTEMBER 1988 • £2.50

ST AMIGA FORMAT

The complete package for Atari ST and Commodore Amiga owners

WHIRLY WIZARD



Whirligig heads the month's best games

ROBOTS!

How the ST and Amiga are tooling up for the future

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  Definitive review of the Big Disk
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  The best ever Amiga paint program?
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ST AMIGA FORMAT
ISSUE 3
SEPTEMBER 1988

PUBLISHED BY
FUTURE PUBLISHING LTD
4 QUEEN STREET
BATH
AVON BA1 1EJ
Phone: 0225 446034
Fax: 0225 446019

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Future Publishing Ltd,
The Old Barn, Somerton
Somerset TA11 7PY
0458 74011

PHOTOGRAPHY
Ashton James,4 Saw Close,Bath

PRINTERS
Chase Web Offset, Plymouth

DISTRIBUTORS
SM Distribution, 6 Leigham Court Rd, Streatham SW16 2PG

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ST/Amiga Format is an independent publication and has no links whatsoever with Atari or Commodore.
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ST AMIGA FORMAT

The complete package for Atari ST and Commodore Amiga owners

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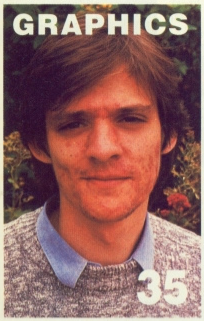

MASTER OF LIGHT

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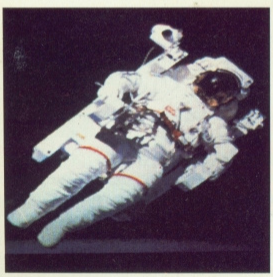

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WORK AND PLAY

Now that we've reached the grand old age of three (months, that is), we're getting a good mixed bag of post each morning. Of all the suggestions for improving the magazine, the two most common are (a) drop all the boring business and programming stuff and just cover the games, or (b) drop all the kiddy games stuff and just cover the business and programming.

In a way, we half expected this. After all, the ST and the Amiga are the first true all-round home computers: they've both got brilliant graphics and stunning sound for games, and they've got massive memories and high quality screens for the most demanding of business applications. There will always be people who don't realise how powerful the other half of the machine they own really is.

In the old days, you might have had an IBM PC to work on, alongside a Speccy for a quick zap when you felt the need for light relief. Now one machine does the lot.

The vast majority of correspondents are delighted with the mix of serious and entertainment software in *Format*. People who bought their ST or Amiga purely to play games on are discovering how to tap its underlying power, and people who bought one as a specialist workstation – graphics, music or business – are discovering the joy of playing the best games written by top programmers the world over.

We've got a suggestion to solve the arms race in one fell swoop. It's simple really: give all leaders of the world governments an ST and Amiga each, and they'll be so busy swapping tips on their new discoveries they'll be too busy to do any harm. Brilliant! Why hasn't anybody thought of that before?

MUSIC

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DESKTOP 83

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WORKBENCH 86

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NEWS

Making a song and dance

'STOS – The Games Creator' is a new BASIC-like ST programming language, specifically designed for producing graphics action games with. Written by French software house Jawx International, the European rights have been picked up by Mandarin Software of glamorous Macclesfield.

Unusually for a games creation program, it seems that the major programming houses are very interested in using it. In the past, companies have scorned adventure creators like GAC and PAW, claiming they only produce very limited and similar games. In this case though, French software house Ubi Soft have already written their latest game *Skate Ball* with STOS, and are reportedly very pleased.

Among STOS's reported features are: moving up to 15 sprites on screen at once; adding an interrupt driven music backing track; inserting pre-defined sound effects; compressing Degas or Neochrome graphics screens; generating pull-down menus; and scrolling up to 16 different scren areas independently.

The STOS package includes three sample games written with STOS for you to examine, an icon editor, a sprite editor, a character set editor, music editor and room designer. Spreading over three disks, it comes in at £29.95.

■ Mandarin Software, Europa House, Adlington Park, Adlington, Macclesfield SK10 5NP (0625 878888)

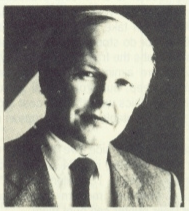
■ *The sprite designer in STOS*

PRICE WAR LEADS AUTUMN 16-BIT PUSH

It now seems almost certain that the price of the basic 520ST will drop to £299 in the Autumn, re-establishing its price differential over the Amiga. Paul Welsh, Atari's UK Marketing Manager, confirmed that details were being finalised on a follow-up promotion to the successful Summer Games pack, which offered £400 worth of high-quality games in the £399 ST price.

As of September 2nd 1988, Atari dealers will be offering two packages: a basic 520ST at £299, or a bundled deal again of ST plus around £400-worth of games software at £399. Welsh commented, "We haven't tied up all the games yet, but I expect them to be of the same standard as the Summer Pack, which went very well." In other words, they will be repackaged recent full price releases, not budget games.

Welsh added that Atari have earmarked £1.2 million for TV campaigns and advertising in the pre-Christmas period, and he expects to shift 70,000 STs. Official Atari figures say there are around 150,000 STs in the UK already, but independent estimates would put it at not much higher than 100,000.



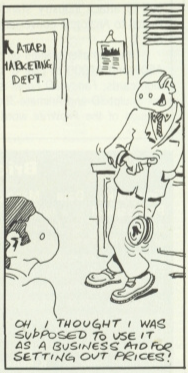
■ *Welsh: looking to sell 70,000 STs in the pre-Christmas period.*

Amiga assault

Commodore are responding by setting out their plans for a massive advertising campaign leading up to Christmas. Following the recent price cut to £399, the so-called 'Cheese advert' is running in the quality dailies for the late summer extolling the virtues of the A500. A four-week TV campaign is earmarked for the last two weeks in November and first two in December.

Dean Barrett, Welsh's counterpart in Commodore, was optimistic about the Amiga's autumn prospects. "I've got no control over Atari's pricing policy, but we're putting our biggest ever push into this year," he said. "Last year we only spent a million or so, this year we'll be at least treble that with the bulk of the spend in the pre-Christmas period." The theme of the TV ads hasn't been finalised yet, but Barrett added sardonically, "They won't be featuring the Chelsea football team."

The advertising campaign begun two years ago by Apple to push its Macintosh as a specialist DTP system rather than a general-purpose computer is widely credited with turning round the fortunes of the company. Commodore may well be hoping for a repeat of 'the Apple effect' by pitching its high-end A2000 range machines at specific vertical markets rather than as general all-purpose micros. It's no secret that Commodore are putting together a desktop publishing package based around the Amiga, although as yet the components haven't been named. A suitable minimum configuration system would be a twin disk drive A2000 running Professional Page, maybe with a high resolution monitor, at around £1500 excluding any printer.



Enabling word processing

Arnor have released an updated version of their *Protext* word processor, v3.6, for the ST with several novel features. One which could be a life-saver for disabled users is a new way of using the [Shift], [Control] and [Alternate] keys. Typing [Control]K can be impossible if you don't have full use of both hands, so now you can press [Control] first and then K, for example.

Other new features include the ability to redefine any character's screen appearance, and for the first time you can run GEM desktop accessories from within Protext. You can convert First Word files into Protext format, retaining all the emboldening codes and so on. Perhaps most useful is the 'Phrase/macro record' mode – you can record any series of keystrokes and 'replay' them later on. Ideal for those repetitive editing chores.

Protext costs £79.95, or £15 if you are upgrading from a previous version.

■ **Arnor, Protext House, Wainman Rd, Peterborough PE2 0BU (0733 239011)**

AMI-EXPO '88

A major event in the Amiga calendar took place in Chicago between 22nd and 24th July – Ami-Expo, the Amiga developers' showcase. Martin Lowe from The Amiga Centre Scotland went over to scout out new products.

Most exciting was perhaps the demonstration of the long-awaited *Video Toaster* from NewTek. The Toaster is an effects processor to produce Top-of-the-Pops style results from your Amiga. You plug a video camera into it, and the Amiga can take the image, squeeze it onto a sphere, flip it, split it, pixelise it or do stop-motion all in real time – that means as fast as the camera grabs the frames. Complete with a broadcast quality genlock, NewTek are aiming at a price of 'under $1000' in the States. That sounds steep, but professional genlocks alone can cost £750, and real-time graphics workstations cost around £40,000 at the moment. A PAL version suitable for the European market is under development.

On the even more expensive graphics side (we're talking over £5000 – you can't afford it, but drool anyway!) is a 24 bitplane colour scanner from ASDG. This can grab images in 16 million colours, and although the Amiga can't display them all, modern colour output devices such as Tektronix' colour laser printer can print them.

Two others from ASDG are *Cygnus Ed Professional*, a specialist programmers' text editor at £75, and the *Twin-X* board. Cygnus Ed includes lightning fast scrolling, search at 100,000 characters per second, moving text blocks in vertical columns, multiple windows open to the same file, and an interface to the A-Rexx standard data interchange language. The Twin-X board is a plug-in to the A2000 to allow you to attach industry standard hardware like barcode readers and Digital to Analogue converters. Sounds essential to hardware developers.

Other smaller utilities on show included an expansion rack for the A500 and A1000 to give 6 slots for A2000 or PC-compatible expansion cards; *Fancy 3D Fonts* is a set of three specially designed fonts for Sculpt-3D and Animate-3D, going for £49.95; there's a PostScript version of the *ProWrite* word processing package, for those of you who own laser printers; and finally *WSHELL* is a replacement for the standard CLI which is a commercial development of the PD ConMan program. As well as being able to edit your last command lines, which the Commodore Workbench 1.3 release due in the Autumn will offer anyway, WSHELL offers command aliases, resident commands (no more swapping disks to get a directory!!!) and the ability for CLI users to 'pipe' data (send the output of one program to the input of another) between two tasks running concurrently, all in about 10K.

■ For further details about any of these products, contact the Amiga Centre Scotland, 4 Hart Street Lane, Edinburgh EH1 3RN (031-557 4242)

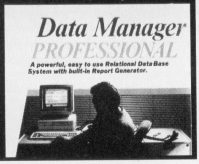
Brief briefs

Timeworks Data Manager Professional is a new top-end database package for all models of ST. It costs £69.95 from Electric Distribution (0954 61258), and claims relational database operation, fast sorting of data, a simple set-up procedure and a built-in word processor.

Kuma (07357) 4335 have revamped their ST **K-Minstrel** music composition program. Version 2 sells at £29.95, or a £10 upgrade to existing K-Minstrel owners. Notes are displayed on-screen during composing and editing; up to 3200 chords can be stored in 4-channel mode, which comes to around 20 minutes playing time, Kuma reckon. It's fully GEM based and MIDI compatible.

Digita (0395 45059) are bringing their business PC and ST software ranges to the Amiga. Following Digicalc (reviewed last month) and Home Accounts (this month), **Mailshot** and **Mailshot Plus** (£24.95 and £49.95 respectively) are out to ease the burden of businesses doing direct mail operations.

Advanced Memory Systems – purveyors of the DTP *Stop Press* range on most home micros – have been bought up by the Swiss company Logitech. Logitech are major mouse producers, supplying the rodents for Hewlett Packard and others, and AMS used their mice in their own DTP packs. Acquiring AMS seems to be a move by Logitech to sell DTP kit directly, rather than go through distributors as before. How the deal affects the launch of *Finesse Paint*, AMS's ST DTP add-on, isn't yet clear.



British Music Fair

Chris Jenkins battled his way through the maze at the Wembley Conference Centre and reports on the 1988 British Music Fair, where there was plenty to excite ST and Amiga owners.

Space 1999

Perhaps the best news came from the oddly-named MCMXCIX (1999 to you): most of the American *Dr. T* software range is to be launched on the Amiga. This includes KCS, the Keyboard-Controlled Sequencer program, and a huge range of patch editors for the Roland D50/10/110/MT32, Yamaha DX7/TX81Z, Casio CZs, Kawai K1, and Ensoniq ESQ1, at around £120. There's also the music score writing program *Copyist*. The beginner's Level 1 package costs £79.95, whereas Level 3 at £299.95 supports laser printers, desktop publishing packages and alternative fonts. Also on the way is another range of Amiga patch editor/librarians from Soundquest, including all the old favourites plus a generic librarian for a huge range of synths, with prices

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Kings Quest Pack (inc I-III)	Sierra	24.99	16.50
Leaderboard	U.S. Gold	24.99	16.50
Leather Nun of Phobus	Infocom	29.99	19.50
Leathernack	Microdeal	19.99	13.50
Leathernack 4 Player			
Adpt	Microdeal	5.95	4.50
Leisure Suit Larry	Sierra	24.99	16.50
Marble Madness	Electronic Arts	19.99	14.50
Mean 18	Accolade	24.99	17.50
Mercenary Compendium	Novagen	24.99	16.50
Mindfighter	Abstract	24.99	16.50
Mission Elevator	Reline	19.99	13.50
Moonmist	Infocom	29.99	19.50
Ninja Mission	Mastertronics	9.99	7.00
Obliterator	Psygnosis	24.99	16.50
One on One	Ariolasoft	29.99	19.50
Othello	Robtek	9.99	7.00
Passenger of the Wind	Glenet	24.99	16.50
Pawn	Rainbird	24.99	16.50
Peter Beardsleys Football	Grandslam	19.95	16.50
Phantasie III	S.S.I.	24.99	16.50
Pinball Wizard	Kingsoft	9.99	7.00
Pink Panther	Magic Bytes	19.99	13.50
Plutos	Mastertronics	14.95	10.25
Pool	Masteronics	9.99	7.00
Ports of Call	Aegis	39.99	25.50
Power Struggle	P.S.S.	14.99	10.25
Protector	Prism	9.99	7.00
Red October	Argus Press	24.99	16.50
Return to Atlantis	Electronic Arts	24.99	17.50
Rockford	Melbourne House	19.99	13.50
Romantic Encounters	Microillusions	24.99	16.50
S.D.I	M indcraft	29.99	19.50
Scenery Disc 7	Sublogic	24.99	16.50
Scenery Disc 11	Sublogic	24.99	16.50
Scenery Disc Europe	Sublogic	19.99	13.50
Scrabble II			
Sentinel	Firebird	19.99	13.50
Seven Cities of Gold	Electronic Arts	14.99	10.25
Shadowgate	Mindscape	24.99	16.50
Shanghai	Activision	24.99	16.50
Sherlock	Infocom	24.99	16.50
Sidewinder	Mastertronics	9.99	7.00
Silent Service	Microprose	24.99	16.50
Sinbad and Throne/			
Falcon	Mindscape	29.99	19.50
Soccar Supremo	Crysys	19.99	13.50
Space Port	Reline	19.99	13.50
Space Quest	Sierra	29.99	19.50
Space Ranger	Mastertronics	9.99	7.00
Space Station	Prism	9.99	7.00
Star Glider	Rainbird	24.99	16.50
Star Wars	Domark	19.99	13.50
Starfleet 1	Interestel	24.95	17.50
Stiplier Conflict	P.A.R.	26.50	19.50
Stir Crazy (Bobo)	Infogrames	19.99	13.50
Stock Market	Tynesoft	19.99	16.50
Strike Force Harrier	Mirrorsoft	24.99	16.50
Strip Poker I	ANCO	9.99	7.00
Strip Poker II	ANCO	14.99	10.25
Surgeon	I.S.M.	49.99	31.50
Swooper	Robtek	19.99	13.50
Temple of Apshai	U.S. Gold	24.99	16.50
Terramex	G.S.E.	19.99	13.50
Terrapods	Psygnosis	24.99	16.50
Test Drive	Electronic Arts	24.99	17.50
The Jewels of Darkness	Rainbird	19.99	13.50
Three Stooges	Mirrorsoft	29.99	19.50
Time and Magik	Level 9	19.95	13.50
Time Bandits	Microdeal	19.99	13.50
Ultima III	Origin	24.99	16.50
Univited	Mindscape	29.99	19.50
Vampire Empire	Magic Bytes	19.99	13.50
Warzone	Prism	9.99	7.00
Western Games	Magic Bytes	19.99	13.50
Winter Olympaid	Tynesoft	19.99	13.50
Witness	Infocom	29.99	19.50
Wizball	Ocean	24.99	16.50
World Darts	Mastertronics	14.99	10.25
World Games	Epyx	24.99	16.50
World Tour Golf	Electronic Arts	24.99	17.50
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SPECIAL OFFERS WHILE STOCKS LAST

TITLE	HOUSE	S.S.P.	OFFER PRICE
Black Shadow	C.R.L.	24.95	15.50
Blastball	Mastertronics	9.99	5.50
Borrowed Time	Activision	24.99	15.50
Brainstorm	Robtek	9.99	5.50
Casiono Roulette	C.D.S	19.99	12.50
Cougars Run	Softgang	14.99	9.50
Cuthroats	Infocom	29.99	12.00
Demolition	ANCO	9.99	5.50
Destroyer	Epyx	24.99	15.50
Diablo	Robtek	19.99	12.50
Extensor	Players	9.99	5.50
Eye	Endurance	14.99	9.50
Final Trip	ANCO	9.99	5.50
Flight Path 737	ANCO	9.99	5.50
Footman	Topdown	24.95	15.50
Galactic Invasion	Microillusions	24.99	15.50
Goldrunner	Microdeal	24.95	15.50
Grid Start	ANCO	9.99	5.50
Hacker	Activision	29.99	12.00
Hacker II	Activision	29.99	12.00
Hollywood Poker	Robtek	19.99	12.50
Insanity Flight	Microdeal	24.99	12.50
Jigaw Mania	Robtek	9.99	5.50
Jump Jet	ANCO	14.99	9.50
Karate Kid II	Microdeal	24.99	15.50
King of Chicago	Mirrorsoft	29.99	18.50
Knight Orc	Rainbird	24.99	12.50
Kwasimodo	Robtek	9.99	5.50
Leviathan	English	19.99	12.50
Mach 3	Loricels	19.99	12.50
Mindshadow	Activision	24.99	12.00
Moebius	Origin	24.95	15.50
Nord and Bert	Infocom	24.99	15.50
Orge	Origin	24.95	15.50
Phalanx	ANCO	9.99	5.50
Q Ball	English	19.99	12.50
Roadwar	Melbourne House	19.99	12.50
Rockey	Robtek	9.99	5.50
Rolling Thunder	U.S. Gold	24.99	15.50
Seconds Out	Tynesoft	19.99	12.50
Silicon Dreams	Microprose	24.99	15.50
Skyfighter	ANCO	14.99	9.50
Starglider	Microdeal	19.99	12.50
Space Battle	ANCO	9.99	5.50
Spellbreaker	Infocm	29.99	12.00
Starcross	Infocm	29.99	12.00
Starways	Robtek	19.99	12.50
Stationfall	Infocm	29.99	12.00
Strange New World	Timewarp	19.99	12.50
Tass Times	Activision	29.99	12.00
Tetris	Mirrorsoft	19.99	12.50
The Wall	Timewarp	14.99	9.50
Thunderboy	Timewarp	14.99	9.50
Vaders	ANCO	9.99	5.50
Vyper	Topdown	14.99	9.50
Wishbringer	Infocm	29.99	12.00
Zork I	Infocm	29.99	12.00
Zork II	Infocm	29.99	12.00
Zork III	Infocm	29.99	12.00

THIS OFFER APPLIES ONLY WHILE PRESENT STOCKS LAST PLEASE CHECK AVAILABILITY

NEW RELEASES

Better Dead Than Alien	Electra	19.99	13.50
Fire and Forget	Titus	24.99	16.50
Mike the Magic Dragon	Kingsoft	19.99	13.50
Iridon	Kingsoft	19.99	13.50
Bards Tale II	Electronic Arts	24.99	17.50
Phantasm	Excoet	19.99	13.50
Japanese Scenery Disc	Sublogic	19.99	13.50
Crash Garrett	Infocommes	24.99	16.50
Thundercats	Elite	19.99	13.50
Morlville Manor	Lencore	24.95	16.50
Street Fighter	U S Gold	24.99	19.50
Pandora	Firebird	19.99	13.50
Tracers	Microillusions	24.99	16.50
Craps Academy	Microillusions	24.99	16.50
Ikari Warriors	Elite	24.99	16.50

UTILITIES

A.C./Basic	Absoft	195.00	132.50
Adrum	Bullfrog	39.99	32.50
Analyse II	M.S.S.	69.95	49.50
Animator/Images	Aegis	103.50	75.50
Arts Part 1	Electronic Arts	9.99	7.50
Arts Part 2	Electronic Arts	9.99	7.50
Audio Master	Aegis	46.00	32.00
Butcher	Eagle Tree	29.95	21.50
C.Library	Benchmark	79.99	60.50
Calligrapher	Interactive	69.95	50.50
City Desk	S.I	114.95	85.00
C.L.I. Mate	P.P.S.	39.95	29.50
Deluxe Music Con Set	Electronic Arts	69.95	50.50
Deluxe Paint II	Electronic Arts	69.95	50.50
Deluxe Print	Electronic Arts	24.95	18.50
Deluxe Productions	Electronic Arts	139.95	110.00
Deluxe Video (PAL)	Electronic Arts	69.95	50.50
Diga	Aegis	57.50	42.50
Digipaint	Newtek	59.95	42.50
Digiview 2.0	Newtek	149.95	105.00
Digiview Adapier	Newtek	82.95	19.50
Director	The Flight Answer	59.95	45.50
DOS2 DOS	Central Coast	39.95	29.50
Express Paint	P.A.R.	69.95	50.50
Flipside	M.S.S.	29.95	21.50
Futuresound	Applied Visions	175.00	155.00
Grabbit	Discovery	29.95	21.50
Hal Calc	Haiter	59.95	42.50
Hot & Cool Jazz	Electronics Arts	9.99	7.50
I.F.F. Library	Benchmark	79.99	60.50
Instant Music	Electronic Arts	29.95	21.50
Intellitype	Electronic Arts	69.95	21.50
Intro CAD	P.P.S.	59.95	42.50
K.Sega Assembler	KUMA	49.95	32.50
Kara Fonts	Kara	59.95	45.50
Lattice C 4.0	Lattice	172.50	122.50
Lisp	Metacomco	149.95	102.50
M.C.C. Pascal	Metacomco	89.95	69.50
Macro Assembler	Metacomco	69.99	50.50
Marauder II	Discovery	39.99	29.50
Maxiplan A500	OXXI	99.95	102.50
Maxiplan Plus	OXXI	149.95	102.50
Microfiche Filer	S.V	79.95	62.50
Modula II	Benchmark	89.95	175.00
Music Studio	Activision	34.99	24.50
On Line	M.S.S.	110.95	99.50
Organize II	M.S.S.	69.99	50.50
Photon Paint	Microillusions	69.99	50.50
Pixmate	P.P.S.	49.95	39.50
Prism	Impulse Inc	59.95	45.50
Pro Board	Prolific	475.00	375.00
Pro Net	Prolific	475.00	375.00
Pro Sound Designer	Edorsoft	34.99	29.50
Pro Video		159.95	127.50
Professional Page	Gold disk	249.95	175.00
Publisher Plus	North East	99.50	72.50
Rock 'n' Roll	Electronic Arts	9.99	7.50
Scribble II	M.S.S.	49.95	39.50
Sculpt 3D	Byte by Byte	85.00	69.50
Sculpt 3D Animate	Byte by Byte	99.00	79.50
Seasons an Holidays	Electronic Arts	9.99	7.50
Shakespear	Infinity	129.95	89.95
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Silver	Impulse	159.95	115.00
Simp Library	Benchmark	79.95	60.50
Sonix	Aegos	57.50	39.50
Superbase	Precision	89.95	32.50
Superbase Professional	Precision	249.95	185.00
T.V. Show	Zuma	69.99	50.50
T.V.Text	Zuma	69.99	50.50
The Works	M.S.S>	149.99	105.00
Tool Kit	Metacomco	39.95	29.50
Video Tiller 1.1	Aegis	110.00	85.00
Videoscape3D	Aegis	143.75	110.00
Word Perfect 4.10	Word Perfect	228.85	175.50
X CAD		460.00	325.00
Zuma Fonts 1	Zuma	34.95	24.50
Zuam fonts 2	Zuma	34.95	24.50
Zuma Fonts 3	Zuma	34.95	24.50
Lattice C Professional Developers Version		275.00	205.00
Lattice Compiler Companian		86.95	67.50
Excellence	Micro Systems	149.95	135.00
Kind Words	Disc Company	49.99	32.50

HARDWARE PRICE LIST

ITEM	S.S.P.	OUR PRICE
A500 Computer Built in 31/2" Disk Drive Amiga DOS Kickstart, Workbench, "The Very First")	399.99	350.00
A500 (as above) with 1084 Colour monitor	699.99	620.00
A500 (as above) with Printer	804.99	750.00
1084 Colour Monitor	349.99	325.00
Citizen 120D Printer	229.85	210.50
A520 T.V. Modulator	24.99	22.50
A501 512K R.A.M Expasion Pack Plus		
Battery Backed Clock	119.99	112.50
B2000 Computer	1295.25	1150.50
B2000/C with 1084 Colour Monitor	1321.53	1268.50
2nd External Disc Drive for A500		105.00
Disc Boxes (Holds 40 Discs)		10.50
Discs Boxes (Holds 90 Discs)		12.50
Mouse Mats		5.00
Pro 5000 Joysticks		14.99
Ram Delta Joysticks		9.99
Alsop Universal Printer Stand		10.99
Citizen 120D Printer Ribbons		3.50
Box of 10 Blank Discs in Box		13.50
Disc Drive Head Cleaners		9.95

around £120; and, from Intelligent Music, the Amiga version of *M*, a very powerful sequencer-cum-arranger originally for the Apple Macintosh.

New ST products coming through MCMXCIX include *Fingers*, a real-time variation generator at £80, and *Phantom*, a revolutionary package which generates and reads SMPTE video/film synchronisation code through the ST's serial port. Used as a desk accessory with a sequencer package, Phantom could save you £200-300 on SMPTE hardware.

Draw a tune

The most unusual new package is Intelligent Music's *MIDI Draw*, an ST package which allows you to translate mouse-controlled graphic doodles into MIDI data. Scales, volume and MIDI parameters can be preset, and performances can be saved as files which are compatible with other sequencers. Price is yet to be announced.

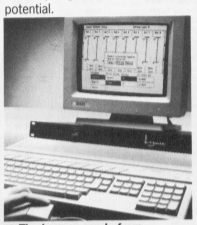
Another good bit of news is the launch of Pandora Technologies, a UK software firm producing ST patch editors which work as desk accessories with all the major sequencer packages. The £79 packages work unusually quickly, come in a Filofax-type binder, and work with the Yamaha DX7, Roland D50/110, and the new Korg M1 and Kawai K1. Another real goodie in the pipeline is *Ludwig*, an 'algorithmic composition tool'. Ludwig works using up to eight simultaneous MIDI tracks, composing music according to sets of simple instructions relating to chords, timings and events. Ludwig's music can be edited in real time, and it creates files which are recompatible with other Hybrid Arts sequencers. Ludwig's not finished yet, but it looks fantastic and it's aimed at the budget market.

Steinberg's huge range of ST products extended with the latest version of the *Pro-24* sequencer (V3), and *The Ear*, an ear-training and music theory program aimed at the educational market.

Stylish Lynex

Last but by no means least, the Lynex sampler from Commander electronics showed how it can outperform much more expensive samplers. Using special signal processing chips designed for missile guidance, the Lynex is a featureless 19-inch black box connecting to the ST's expansion port. Because it doesn't use up much of the ST's own memory, you can load any sequencer package you choose, and use it in conjunction with the Lynex's sampled sounds (and still control external MIDI devices).

The Lynex claims sampling quality above that of Compact Disk, plus anti-aliasing routines which maintain the sound quality even when you transpose over the full MIDI range. Prices start around £1800, which is about the same as conventional keyboard samplers that appear to offer lower quality and less expansion potential.



■ *The Lynex sample from Commander electronics, hooked up to a 1040ST*

CONTACTS

■ *CHEETAH MARKETING, Norbury House, Norbury Road, Fairwater, Cardiff, CF5 3AS (0222 555525)*

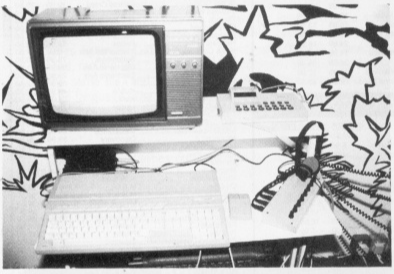
■ *COMMANDER ELECTRONICS, 3-5 Fourth Avenue, Halstead, Essex, CO9 2SY, (0787 475325)*

■ *DR T/INTELLIGENT MUSIC/PANDORA, c/o MCMXCIX, 9 Hatton Street, London NW8, (01-724 4104)*

■ *STEINBERG, c/o Evenlode Soundworks, The Studio, Church Street, Stonesfield, Oxford OX7 2PS*

JUNGLE DRUMS

Good news for owners of Cheetah's £150 MD8 Digital Drum Machine. Rather than loading and saving patterns, songs and drum sounds using cassette, you can now use your ST. The original designers of the hardware have just finished a Pattern Editor package, which uses an on-screen grid system to create patterns, songs and sound kits, then dump them to the MD8 via MIDI. The software will come with around ten sets of eight sound samples, and should cost around £60. Cheetah also announced new sound sets on tape, a range of budget effects pedals, and the MS800, a rack-mounting digital synthesiser at an amazing £199.

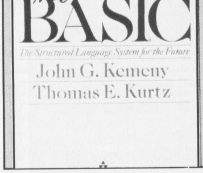


PROGRAMMING NEWS

Typically of course, just as our feature on programming language in this issue went to press, news of some exciting new releases reached the Format offices:

The whole truth

BASIC is a much-maligned programming language, despite being the most popular in the world. It may come as a surprise to you to learn that its creators, John Kemeny and Thomas Kurtz, also think it's a load of bongos.



The reasons are simple: they originally designed a smooth, simple programming language which was then hacked around by hundreds of different computer designers to squeeze into their micros, with arbitrary extra commands being added wherever they were needed. Result: chaos.

To clear their names, Kemeny and Kurtz have designed *True BASIC* – what BASIC should have been, they say. This is now available from Precision Software for both ST and Amiga, price £69.95. True BASIC claims to offer:

Portability – programs written on one machine can be transferred to any other, even if they use graphics and music funtions.

Structure – constructs like IF-THEN-ELSE, SELECT-CASE, DO-WHILE and DO-UNTIL have been added into the language, together with proper support for procedures and separate modules.

Graphics support – commands to draw circles, lines, text and other graphics shapes are part of the language rather than being left to each computer's designers to invent. Drawing is done on a general graphics screen and the system converts it to your particular computer's co-ordinates.

Speed – True BASIC is a semi-compiled system.

C ++ goodies

Good news and bad news for C programmers. The good news – Lattice, omnipresent compiler writers for ST and Amiga, have announced an Amiga version of the enhanced C++ language. The bad news – it costs $500 and needs 1.5MB of memory.

The *Lattice C++* system is a pre-processor that converts C++ code into conventional C for compilation. C++'s main feature is the addition of 'object-oriented' programming constructs onto C's basic framework. One use of this is to define procedures which can take different numbers of arguments, or different types of arguments.

Also on the C front, UK-based Electric Distribution have now got a new version, v3.0, of the cutely-named *Mark Williams* C on the ST. We haven't been able to subject this to the rigours of the Format Laboratories yet, but it claims to be 'typically 12% faster and on average 23% smaller' than other ST compilers.

■ ***Precision Software, 6 Park Terrace, Worcester Park, Surrey KT4 7JZ (01-330 7166)***

■ ***Lattice Inc – UK contact: Metacomco, 26 Portland Square, Bristol BS2 8RZ (0272 428781)***

■ ***Electric Distribution, 8 Green Street, Willingham, Cambridge CB4 5JA (0954 61258)***

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offer only available direct from us, offer starts 1.9.88, expires 31.10.88. Prior to 1.9.88, RRP of Power BASIC is £39.95 and the special offer is not available

Power BASIC Features

- Integrated, fast, easy-to-use GEM editor
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- Compiles from memory to memory for fast development times
- Advanced language, based on world-standard Microsoft QuickBASIC 3
- Powerful Procedures and Functions including local labels, fully recursive
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- Complete access to GEM AES and VDI
- Complete access to BIOS, XBIOS & GEMDOS
- Includes joystick, mouse & sound commands
- Can produce stand-alone program files on disk for you to give away or sell! No royalties
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- Line numbers optional
- Multi-statement lines & multi-line statements
- Easy access to Alert boxes, Menus & Windows
- You'll never outgrow it - access GDOS, resource files, dialog boxes as your skills develop
- Made & Supported in Britain

See the great reviews in PCW June 88, Atari ST User June 88, ST Amiga Format July 88

Also Available: HiSoft BASIC

All the features of Power BASIC plus:

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- Stand-alone .TTP compiler
- Easy access to machine-code (via DevpacST)
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HiSoft
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Orders: (0525) 718271, General: (0525) 718181

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Address:

☐ Please send me a Power BASIC, enclosed is £49.95.
☐ Also enclosed is my GFA BASIC 2 master disk & manual, please also supply Saved! and a mouse mat FREE!

Cheque/PO:
Access/VISA number:
Expires: Signature:

FUTURE PERFECT?

A real appetite-whetter to the new games that'll be melting your mice in the next two months. Andy Storer orders an hors d'oeuvre.

VECTORBALL

VECTORBALL

Mastertronic ■ Amiga ■ £14.99

Two droids play a complex blend of ice-hockey, netball and bowls on a choice of five contoured pitches in what sounds like quite an intense encounter. Super smooth scrolling of fine mesh metallic surfaces ensure it'll look good too. Whether this kind of sport will make the Olympics in 2088 entirely depends on the Android Liberation Front.

SPEEDBALL

Imageworks ■ ST & Amiga ■ £24.99

The new one from the long lost Bitmap Brothers of 'Xenon' fame. Set in Speed Dome it's another future sports sim, this time including weaponry, in fast, dynamic jousting and tackling to blow the opposition away in very sporting two-player action.

SPEEDBALL

MAINFRAME

MAINFRAME

Imageworks ■ ST & Amiga ■ £ not announced

Although we're being saturated with filled 3-D vector graphics at the moment, Mainframe looks like it could win all awards for multi-surface object manipulation. We're talking Fast, Fast, Fast in a game-play to be based in the cyberspace of William Gibson's Count Zero. Since it'll probably be released around the same time as Electronic Arts' version of Neuromancer it looks as though we'll get more than our fair share of cyberpunk.

IRON LORD

Ubi Soft ■ ST & Amiga ■ £24.95

As an apprentice knight, out to prove your bravery, loyalty and courage, you will have to prove your proficiency at archery, wrestling and swordplay. Once accomplished the real fun begins – just you and your sword against beautifully animated medieval backdrops featuring the first 3-D fight simulator. As far as gameplay and graphics go this one will put 'Defender of the Crown' back in the Middle Ages.

POLICE QUEST

Mediagenic ■ Amiga ■ £19.99

This 3D animated adventure is based on an American cop's world of crime and punishment, murder and narcotics. Over 100 city streets and four highways provide the landscape for hot leads and high speed pursuits. Inputs including both full sentence text and joystick control will hopefully make Police Quest more than just a shoot-out fantasy.

RED STORM RISING

Microprose ■ ST & Amiga ■ £ not anounced

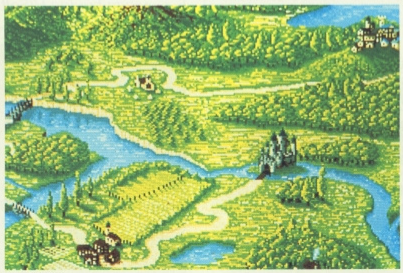
Reputedly far more advanced than Silent Service, Microprose's previous sub-aquatic outing, Red Storm is to focus on the tactical operations of an American nuclear attack submarine in World War III *(sorry, did I miss something? – Ed)*. Your task as the commander is to locate and destroy Soviet subs as they leave their Arctic base using your realistic simulations of on-board sonar and weapons systems which include 'intelligent' torpedoes.

OPERATION WOLF

Ocean ■ ST & Amiga ■ £ not announced

This superior conversion of the Taito number one coin-op will feature six levels of blasting action as you take on the role of a mercenary given the job of rescuing hostages from a war-torn land. No, it's not Beirut but some jungle scenario in which enemy soldiers, armoured cars, choppers and tanks abound.

POWERDROME



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	RRP	OUR
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REVIEW

ATARI CD ROM

Does the thought of slipping the Encyclopaedia Britannica snugly into your pocket excite you? Richard Monteiro reviews Atari's long-awaited CD ROM unit, the CDAR504, which promises to put Gigabytes of data within your ST's grasp.

£399 ■ All STs ■ Atari UK, Railway Terrace, Slough, Berks SL2 5BZ (0753 333444)

A CD-ROM is like a read-only hard disk with a track length of just under three miles, capable of storing over 500,000,000 bytes of data. Huge amounts of information can be stored on a disc no wider than a handspan and whose information can be retrieved at speeds approaching those of hard disks. One thing has prevented this technology reaching home computer users sooner – price. Once again Atari's adage, Power Without The Price (®, ©, ™ etc), rings true: they have introduced a Compact Disc unit that plays both audio and ROM CDs for under £400.

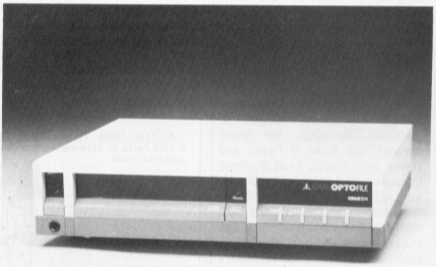
The cumbersomely christened CDAR504 package comes in one midi-sized box (similar in shape to the Mega's processing unit and SH205 hard disk) with a lead for connection to the ST's DMA port, and CD and control software on 3.5" disk. The front panel boasts a power switch (also used to reset the unit), a couple of LEDs indicating disc activity, a headphone socket, an open/close button for the disc table, a pull-out remote control unit and a digital display. The reverse is even more sparsely populated, with just audio out sockets, and DMA in and out, allowing through connection of other DMA devices like hard disks, laser printers and even other CD players).

Computer data

CDs offer around 800Mb of storage, reduced to around 500 Mbytes if formatted for computer data. Visually, there is nothing to differentiate between ordinary audio CDs and computer CDs – the player works out the type of disc for itself.

When connected to the ST, the CD player acts like a high-capacity hard drive. In general, CD 'seek time' (the time taken to find a file once the directory has been read) is similar to early floppy drives (remember there are over 500Mb to search through rather than 360K) and transfer rate is faster than most hard drives (153k per second). In practice it takes roughly two seconds to retrieve any piece of information.

Grolier's Encyclopaedia, although Atari haven't finalised this yet). Software to access the CD drive is supplied on 3.5" disk; this is simply a WIMP program, sticking to the confines of GEM, that allows you to extract data from the CD. Items can



So much for the theory, but how does the CD software and player interact with the GEM environment? Facts on File Inc's Visual French/English Dictionary was supplied with the review machine (retail machines are likely to be bundled with be searched for and then printed or saved as an ASCII file. The saved file can then be merged into other ASCII-accepting programs.

The exact method in which data can be manipulated will vary from program to program. As the CD player

DIGITAL DEALINGS

If you want to be in with the CD crowd you had better gen up on CD-speak. Following is a brief glossary:

Sample – a digital 'recording' of a sound wave. The more bits of memory used to hold the sample, the better the reproduction.

Decoders – Most of today's CD players have 16-bit decoders (they can reproduce the original sample completely). Top-of-the-range players offer 18-bit resolution while the BBC manages very high quality broadcasts using only 13-bits, but keeping the broadcast equipment in top condition.

Oversampling – single samples are fed to digital-to-analogue converters (DAC) a number of times (two or four usually). This has the effect of increasing the maximum sampled frequency.

INNER WORKINGS

A Compact Disc, audio or ROM, is 120mm (4.5") in diameter and roughly 1.2mm thick. Buried 1.1mm under a protective plastic coating lies a reflective layer scored with a fine spiral of pits. These pits represent sequences of binary digits (that is, either 0's or 1's). Data pits are 0.12*m deep and 0.6*m apart with concentric loops of the spiral 1.6*m apart. This means that data is recorded at 16,000 tracks to the inch – a whole heap more than standard 3.5" disks (which offer 96 tracks per inch).

The disc's information is read by a laser beam produced from a gallium arsenide semi-conductor laser. An oval beam of near-infrared light is focussed to a spot of 1*m in diameter. This spot is directed towards the disc's tracks and is reflected back if it hits a space or scattered if it hits a pit. Thus a change in the level of reflected light signals a transition from a pit to space or vice versa.

PERFECT DATA

The major difference between CD-ROM players and their audio counterparts is the extra error correction required. A certain amount of misread information can be tolerated by audio systems because the player simply repeats the last successfully sampled fragment of music (it's so small that you never notice it). However, the tiniest bit of misread computer data can amount to a spectacular crash. Hence the addition of error correction circuitry such as KnowledgeSet's, which boasts one error in every 1,000,000,000,000 bits read.

VIDEO DISC

KnowledgeSet – whose MD is Gary Kildall (founder of Digital Research and creator of CP/M) – are currently working on a method of storing 60 minutes (several gigabytes worth) of digitised video on a standard 4.5" CD. This technology will need extra circuitry which Atari hope to eventually include in the CDAR504. The data compression technique won't be compatible with Philips' forthcoming CDV (see issue 2 for more on laser disc technology), so pop video CDs won't work with Atari's player.

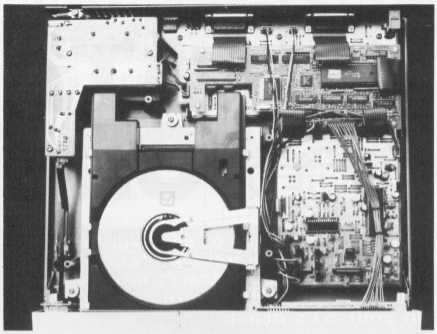
works like a large capacity read-only hard drive, it will be possible for applications to auto boot from the player, or for the player to bring up a desktop which includes a CD player drive icon (which can be clicked on in much the same way as existing drive icons), or – like the French/English Dictionary – software on 3.5" disk will contain the control program to extract the data.

What software?

It's basically what Americans call a chicken and chicken situation: software houses aren't willing to invest thousands in CD-software manufacture until there's a healthy presence of CD-ROM users; few people will buy such hardware if there is next to no software support.

But maybe the situation is not that bad; Nimbus Records are producing a disc containing a massive catalogue of music, Pergamon will be releasing the International Encyclopedia of Educational sometime next year and Syndromic Music are planning a library of digitised sounds which can be used with MIDI instruments. Other parties involved in CD goings-on include GST and Kuma, but they are keeping quiet about their exact plans.

Hot from Atari UK comes the news that the CDAR504 can read the so-called 'High Sierra' format CDs. This means that Microsoft Bookshelf (which includes the American Heritage Dictionary, Roget II: Electronic Thesaurus, the World Almanac and Book of Facts, and Forms and Letters), Small Business Consultant, Stat Pack and the like will work with appropriate GEM software in control. Currently IBM PC and PS/2 machines can run these titles: Les Player, Atari's technical director, is confident that some of Microsoft's packages will be available shortly for the ST.

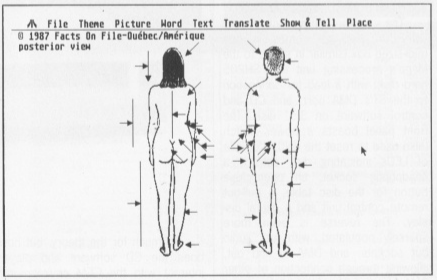


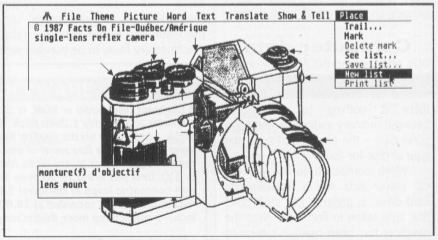
■ *The Atari CD ROM player looks like a normal audio CD player, and can in fact send your Dire Straits collection through your Hi-Fi if the urge takes you.*

Audio ability

When the pleasures of leafing through an encyclopaedia pall on you, you can always use the Atari CD ROM unit to blast out *Brothers in Arms*. If you don't intend listening to music through headphones then an amplifier and speakers are essential. Audio track selection is made via a remote control unit which offers start/stop, forward, reverse and first-track options. A desktop accessory provides the same choices through software.

Atari's player, in sound reproduction terms, is similar to many of the cheaper audio units available from high street outlets. CD reproduction, compared with record or cassette, is naturally of excellent quality, but unfortunately many features usually considered standard on audio players are missing: direct-track access, repeat play, programmable track replay and favourite track selection (FTS). With this in mind, if you are intending to use the player mainly for audio purposes, you're better off with any of the Philips 4 series or Technics SL-P550+ range.





■ *The ST busy retrieving data from the visual and risqué French-English dictionary on the CD ROM.*

ANALOGUE AND DIGITAL SOUNDS

When a signal in a recording medium – be it from a magnetic tape or record groove – varies continuously and in proportion to the sound that caused it, the sound is said to be analogue. It is very difficult for the recorded signal to correspond exactly to the original sound: certain frequencies may not be reproduced properly, components can misbehave, harmonics and noise may be added. These effects may happen during recording or playback. In short, distortion occurs all too easily.

An alternative method for accurately storing sounds is to make snapshot measurements of the incoming sound waves at a high frequency, record the measurements, and on playback reconstruct the sound from those measurements. Once a sample measurement is taken it can't be degraded; numbers can't decrease or increase in value unless operations are performed on them. As long as the reproducer can re-translate the stored the numbers correctly, there should be no distortion.

This digital recording technique requires that a waveform is read often enough to ensure a true representation is recorded. The sampling rate must be at least twice that of the highest frequency to prevent 'aliasing' (chopping off frequencies greater than half the sampling rate); in the CD's case the sampling rate is 44.1kHz.

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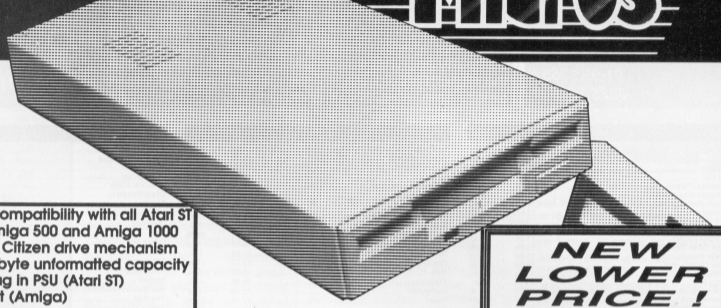

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REVIEW

WATCH YOUR LANGUAGE

Programming languages bring out very strong feelings in people, especially programmers. The advantages of C over Pascal, Pascal over BASIC and BASIC over C promote a never-ending cyclical debate. Which one is right for you, and which are the latest contenders? Read on, find out, choose...

Once you've tired of *Terrorpods*, when you're weary of *Word Perfect*, when you're driven dopey by *Degas* you may start to wonder if there isn't more to life, and computing in particular, than running programs other people have written. What about writing your own? If you've tried using ST or Amiga BASICs you'll know something of the problems and triumphs that programming can bring. There are plenty of languages other than BASIC though, each of which has its own advantages and aficionados.

BASIC

The most popular programming language for micros, and unfairly maligned by those who haven't used modern versions. Its advantages are its friendliness to the first time user, its interactiveness and its forgiving nature with errors. Antique BASICs (like ST BASIC!) gave the language a bad name, being slow and hard to program. Super modern versions can be very good – often having compilers and structures like procedures borrowed from 'better' languages. BASIC is a good all-rounder, and the modern versions are suitable for computation, text handling and graphics work, though they are normally not as fast as C or Pascal because they tend to be interpreted not compiled.

C

Probably the second most popular language, C claims to offer near machine-code speed without all the complexity of low-level programming. There's no doubt that C is fast, and many business programs are written in it for this reason; it is also very portable from one machine to another. C can be a little hard to understand at first, as its source code is not as self-explanatory as some more verbose languages. The structure of the language, though, allows you to do almost anything you like with the machine. Watch out for C's lack of error checking though. Obscure bugs can produce the strangest effects in C programs. It's a good, multi-purpose language.

Pascal

One of Pascal's main tenets is to produce very readable source programs; it also majors on rigid constraints to make you write 'good' code. Pascal is only available as a compiler and is good if you like a language to check what you're doing. It is happy to throw up all kinds of error messages during compilation to let you know of syntax and program errors before you get near to running the code. Pascal is particularly good for writing long programs, as its imposed structure makes the source code maintainable. Its string handling is not as advanced as BASIC's, nor is its machine access as good as C's, though it has still been used to write word processors. Good compilers can produce code as fast as C.

Modula 2

To some extent Modula 2 is a rewrite of Pascal, but with a major change to its design philosophy – the idea of modules. As parts of a program are compiled they can be stored in libraries and combined together into the finished program. Modula 2 is the newest of the micro programming languages, but compilers are available for both ST and Amiga and offer many of the advantages of Pascal with the bugs fixed (eg. dynamic strings), plus the development speed advantage of separate module compilation. Some modern Pascals have tried to get round this by adding modules to their compilers as an extra – cheats!

Assembler

Because compilers generate machine code by set formulas, high-level language programs are rarely as fast as if you write them directly in Assembler yourself. Assembler is very hard to write because it takes you 10000 lines to do what 1000 lines of C would do, and any mistakes usually cause an instant machine crash! If you need really fast code, most languages let your write the critical routine in Assembler and leave the rest in C or whatever. Most business programs are written in a high level language, most games are still done in Assembler because that's the only way to get really fast graphics in the smallest possible space.

And the rest

There are of course dozens of other languages with their fans. **Forth** is quite different in design from most other languages. It's written in an assembler-like mnemonic form, and works with a 'stack' of numbers rather than providing variables in the conventional way. It also uses 'Reverse Polish Notation', which is like adding numbers backwards. It's hard to get the hang of at first. **BCPL** is a historical oddity: when Commodore launched the Amiga, their plans for the operating system fell through at the last moment, and they bought in an adaptation of the Cambridge University 'Tripos' operating system, which happened to be written in BCPL. C is a later derivative of BCPL. **Prolog** and **LISP** are two 'artificial intelligence' languages good at splitting sentences up into nouns, verbs, etc, and of course **Occam** is the new parallel processing language for controlling transputers.

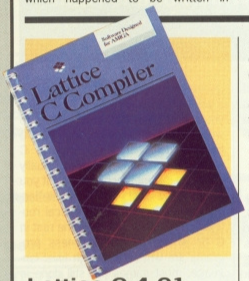
So which one's for you?

As always, and without wanting to cop out, the final choice of language must be your own. You should look at the particular programs you want to write and analyse the features that will be most important to you. Don't dismiss BASIC as the language snobs would have you do – the friendly development environment it offers is a real help. If you want to sell programs you'll need a BASIC system with a compiler, to be able to generate stand-alone programs that don't need the interpreter on disk too. If you intend to write complex games, number crunching or graphics applications, consider making the extra investment of time in learning 68000 assembler; for general applications C seems to be far and away the most popular language at the moment, and so has the best support (the Amiga technical manuals give all their examples in C, for instance); if there are going to be ten different programmers, you may find the structure of Pascal makes the code simple to integrate and debug.

COMPILER COMPANION

Lattice also market a 'Compiler Companion' kit with ten utilities to help programmers in all languages – Pascal, C, assembler, the lot. If you're used to a UNIX environment this lot will make you feel at home: DIFF and SPLAT (compare and update files), EXTRACT and BUILD (make batch files), FILES (file search), GREP (search for text in files), LMK and TOUCH ('Make' type utilities to time stamp files, keeping source and object files in step), WC (word count) and CXREF (a C cross-reference generator to list your variables out).

If you're writing really big systems with dozens of modules, or are an experienced UNIX programmer, you'll find these very useful, but average users can probably get by quite happily without. Cost is £75 from Metacomco.



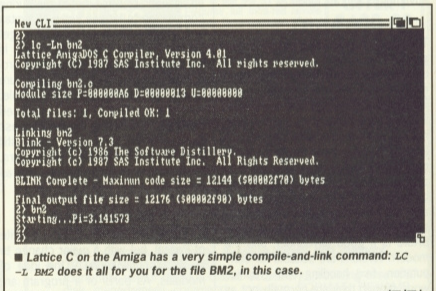
Lattice C 4.01

All Amigas
2 drives recommended
£115 (standard), £215 (developers) ■ Roundhill Computers

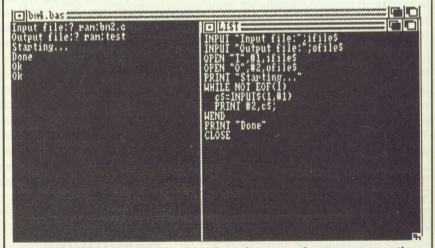
Lattice Systems in the States have a pretty good reputation for writing robust programming tools, and it's no surprise that their Lattice C has become a standard. Version 4 is a major overhaul of version 3 (students of number theory should not be too surprised at this), and continues the endless struggle for faster but smaller code.

The package comprises four disks, of which two are necessary for the boot sequence and general compiler operation. The final two disks are a collection of utilities, examples, header files and other goodies. The boot disks have been very well set up, so there is almost no installation needed. Just back the disks up and reset your Amiga. All the logical devices are ASSIGNed for you so that the compiler and linker will find the libraries without you worrying about path names. The only omission is that there are no printer drivers on the boot disk, which makes printing your first listing very hard work!

Also included in the boot sequence are two PD utilities, *ConMan* and *PopCLI*. ConMan modifies the CLI so that you can retrieve and edit your last few command lines – invaluable when linker commands specifying half a dozen libraries can stretch to two lines! – and PopCLI lets you open a new CLI window at any time by pressing Amiga-[Esc] – equally invaluable when your program crashes and you can't type any commands. It goes without saying that it is assumed if you are techy enough to


New CLI
2>
2> lc -Ln bn2
Lattice AmigaDOS C Compiler, Version 4.01
Copyright (C) 1987 SAS Institute Inc. All rights reserved.
Compiling bn2.c
Module size P:000000A6 D:00000013 U:00000000
Total files: 1, Compiled OK: 1
Linking bn2
Blink - Version 7.3
Copyright (c) 1986 The Software Distillery.
Copyright (c) 1987 SAS Institute Inc. All Rights Reserved.
BLINK Complete - Maximum code size = 12144 ($00002F70) bytes
Final output file size = 12176 ($00002F90) bytes
2> bn2
Starting...Pi=3.141573
2>
2>

■ *Lattice C on the Amiga has a very simple compile-and-link command:* `LC -L BM2` *does it all for you for the file BM2, in this case.*



■ *AmigaBASIC gives you a nice friendly environment where you can see the program's code and output in separate windows. Debugging isn't so easy with a compiler.*

LATTICE C ON THE ST

£99.95 ■ METACOMCO ■ NEEDS ONE 720K OR TWO 360K DRIVES

UK-based Metacomco have done a licensed reimplementation of Lattice's Amiga code on the ST, but as yet this is still the older version 3 system. However, by way of recompense there are many nice extras which bring the system up to Amiga 'developers' spec.

As the ST has no standard text editor, Lattice comes with a simple one. It uses GEM menus and conventions, but is hardly inspiring. It's a stand-alone editor, so there is no integrated error flagging from the compiler. It's just about feasible to run Lattice C on a single drive ST (double sided drive) but it helps if you've got a 1040 or Mega and can set a RAM disk up.

There is a 'menu shell' system to give you a rough and ready edit-compile-debug-link-run environment. A 'Make' utility helps you keep your object and source files in step. Unlike the Amiga Lattice C, there's no 68000 Assembler provided. An extremely useful symbolic debugger is provided, which allows you to trace your program's execution step-by-step, print out the contents of named variables, and otherwise spot your programming errors at run time.

If you don't specifically open a GEM window, standard output goes to a simple TOS text stream, and control returns to the GEM desktop when the program finishes (wiping your output off the screen).

Overall, it's an excellent system for the serious programmer, producing very efficient code, but it doesn't make too many efforts to be friendly to novices.

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DEVELOPERS EXTRA

So what do you get for the extra 100 smackeroos in the 'Developers' version of Lattice C? The first thing is a decent text editor, so you can throw ED out the window *(Sniff – Ed)*. Also provided is Metascope, a symbolic debugger to help you trace program execution, a 'Make' utility to keep libraries of modules up to date, and a few text utilities. All very useful, not to say essential to serious programmers, but you can't help feeling they ought to be in the standard package, especially as they *are* on the ST.

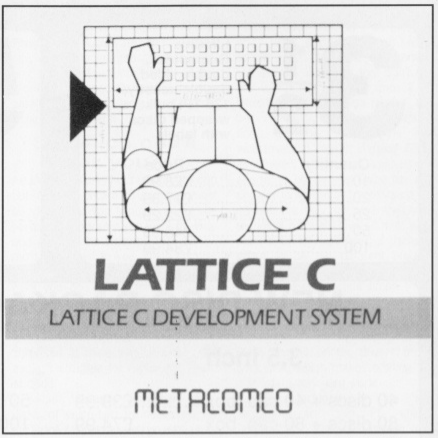
write C you are au fait with the Amiga's CLI – no cuddly Workbench icons here, matey.

So you come to writing your first C program. One major omission from the standard Lattice system is a text editor. Either you fork out the extra £100 for the developers version (see margin note), or you use the Amiga's very own ED.

Easy as A, B, C

Compiling a program is made as simple as possible. To compile and link a file TEST.C into a runnable program you would just type `LC -L TEST`. The resultant file TEST can be run as a stand-alone CLI command. You can compile and link separately if you want to – the linker is version 7.3 of the PD BLINK linker – and you can also run only the first pass of the compiler, to check for syntax errors in long programs.

The compiler's error trapping is a bit mixed. In general the line numbers it gives are very accurate – error on line 315 really means line 315 – but it is susceptible to spurious knock-on errors. For example, on one test file we missed a `*/` comment terminator off, resulting in a 'illegal macro usage' 100 lines later! It is very good at giving warnings that can reveal bugs, such as using uninitialised variables, or misplaced semicolons in IF statements that mean control can never reach a certain line.



Speed 'em up

Compilation speed and link time have been greatly improved over version 3. Code sizes have generally shrunk by 20%, but any speed-up of final code is variable. Lattice claim the IEEE maths libraries have been turbocharged by a factor of 5, but on simple arithmetic you won't notice much change. 16-bit integers are now properly supported, some common string functions that are usually library calls are now built in to save space in the final code, and the linker can now handle true overlays for those really whopping programs.

One nice option is the ability to specify whether code is to go into Fast or Chip memory – this is handy for graphics programming as the Amiga's screen hardware can only access the 512k of Chip memory. If you're of a mind to write 68000 code you can't include it in-line in a C source file. However, an Assembler is provided with the package, and you can of course link assembled modules in with C ones.

The Lattice manual is good enough, and documents the various C library routines pretty well. Small code fragments tell you what `include` files you need, and show you the gist of the usage. Regrettably there is hardly any attempt to explain access to AmigaDOS – you're left to plough through the daunting ROM Kernel manuals yourself. There ought to be some extra libraries of simple 'open_window' commands to aid novices.

Lattice C version 4.1 is undoubtedly capable of producing superb compiled code. Programming in C is where the action is, by popular vote, and the serious programmer who needs efficient code and detailed machine access will look a long time before bettering Lattice C.

features 0 1 2 3 4 5
performance 0 1 2 3 4 5
ease of use 0 1 2 3 4 5
manuals 0 1 2 3 4 5
format value 0 1 2 3 4 5

for

- **Simple installation**
- **Easy compile-and-link commands**
- **Fast, compact code**
- **68000 Assembler included**

against

- **Editor and debugger should come as standard**
- **Unfriendly environment for novices**

MCC PASCAL 2

Amiga version reviewed, ST version also available

£89.95 ■ Metacomco

There can be few who don't realise the connection between the Bristol-based company Metacomco and the Amiga – AmigaDOS, the computer's multi-tasking operating system was written by Metacomco. Despite the pre-eminence of C for system programming, there is still a hard core of Pascal-using Amiga owners, and Metacomco released MCC Pascal to provide them with the same system-level access as C. The new version, Pascal 2, has been considerably upgraded, with many new features and a good few 'problems' fixed.

New features

There are a number of additions to the original version of MCC Pascal, the most significant of which is the ability to compile separate modules which can be linked together after compilation to produce a finished program. This means that once a section of code has been written and satisfactorily debugged, it can be combined with further code without having to be compiled again.

This technique speeds compilation of large programs, which can now be sub-divided into several smaller modules, and lets you build up your own library of commonly used procedures to incorporate into your programs. MCC Pascal handles modules via three new keywords: MODULE, IMPORT and EXPORT. MODULE is used instead of the keyword PROGRAM to head a source module, and IMPORT and EXPORT are used to declare procedures or functions within the module and program so that they're prepared to link with each other.

Dynamic strings are now supported, along with functions including CONCAT, COPY, DELETE, INSERT to manipulate them. Standard Pascal only considers fixed length arrays of characters and leaves you to write

your own functions to handle them. The new facilities certainly make life a bit easier.

Random access files are now supported too, so programs such as databases or accounts packages are much easier to implement. New keywords are introduced to handle random access files, and include functions to return the current position of the file pointer and to reposition it to a defined record.

Other useful additions to the language include bitwise operators to manipulate bits within bytes, STEP in the FOR structure and OTHERWISE in CASE statements. There are even PEEK and POKE statements (*Shock! Horror! – Ed*), though quite what use these have on an Amiga is not clear. Expect a fairly heavy visit from the Guru if you use them carelessly.

Edit, compile, link, debug

The process of program development follows a cycle of editing, compiling (and linking to other program modules), noting your errors and re-editing. The quicker and easier the environment (editor, compiler etc) can make this process, the more useful the system will be, and the more programmers are likely to use it. MCC Pascal handles the compilation part of the cycle, leaving you in the hands of ED for your editing and left to your own devices for the logic errors.

The compiler itself is invoked from the CLI and the linker can be called to follow on behind, automatically. It would have made life a lot easier to have an integrated editor-compiler which could bring you back to the source when compiler errors are discovered. The linker is the old faithful ALINK as on the Amiga master disks (purportedly written by Alan at Metacomco, hence 'A' LINK). The best way of setting up the compilation process, particularly when specifying paths to the source or object files, is via a command file. This can be written in ED and then EXECUTEd to call the compiler.

Compilation is reasonably fast, though a program of any complexity is likely to make many calls to the library modules, more of which later. The compiler and libraries are fairly compact, so you can get the lot on a single disk, so it's therefore feasible to run MCC Pascal from a single drive machine. Overall the compilation/link cycle is fairly long winded, which puts an extra burden on the programmer to get the code right first time.

Library routines

MCC Pascal is a specific implementation for the Amiga, and as such contains external function calls for nearly all the low-level ROM kernel routines. This is fine for the system programmer, who is prepared to invest £100+ in the ROM Kernel manuals and wade through their contents (only a list of the calls is provide in the Metacomco manual), but is not really adequate for applications programmers.

GREEK, LATIN, PASCAL AND C

The first computer program ran at Manchester University on June 21st 1948. This was effectively written in binary; the operators worked out which bits of each word needed to be on or off, flicked a few switches on the front panel, and set things going. As a result, only the machine's designers could actually program it. The first 'language' was assembler. A clever student decided to write a program that would read a file of short mnemonics ('mnemonics' are memory-jogging abbreviations) and convert it into binary automatically.

In 1954, John Backus got fed up with being pestered by physicists to write programs for them, and decided to devise a system to let people write their own programs without intimate machine knowledge. FORTRAN (Formula Translation) was the result, compiling its first program in 1957 on an IBM 704 computer. The business fraternity – envious of how FORTRAN had allowed mere scientists to write programs – developed COBOL (Common Business Oriented Language) in 1959. Between them, FORTRAN and COBOL still dominate the world of programming, to the regret of many.

About the same time, the end of the 50s, the academics struck back. John Backus, realising his mistakes in FORTRAN, helped design Algol in 1959. This brought the concept of procedures, local variables and recursion into the world, and at heart is very similar to today's Pascal. John McCarthy (no relation) developed LISP in 1960, still regarded today as an exciting language for artificial intelligence work.

The 60s saw a split in the language world, some people opting for complexity and others for simplicity. In 1968, the Algol team met to revamp the language. They bolted dozens of extra features onto it, and one academic, the Swiss Niklaus Wirth, was so horrified by the result he went off and designed a really simple teaching version of Algol, called Pascal. Familiar? (Ten years on, he too indulged in a revamping exercise, turning Pascal into Modula-2.) Also in the quest to make programming simpler, Kemeny and Kurtz invented BASIC in the late 60s.

In 1971, a Cambridge academic designed a simple language called BCPL (the inventor, Martin Richards, says that the CPL bit stands for Combined Programming Language, but he isn't sure whether the B stands for Basic or Beginners.) This achieved worldwide obscurity, until Americans Thompson and Ritchie modified it to become the language B, then a new version called C in 1973. By an accident of history (ex-Cambridge academics wrote AmigaDOS), BCPL was also the language chosen to write the Amiga's operating system in.

The person who needs to put together a program for an end user doesn't want to get involved with `SetMathIeeeDoubBasBase` or `ModifyIDCMP`. By all means provide these routines for those who want to tweek the Amiga's innards, but also supply `OpenWindow(X1, Y1, X2, Y2, gadgets)` for the 90% of programmers who want to put together their own applications, fast. The Amiga's operating system is complex, which is even more reason to have pre-packed standard functions for simple graphics, form design and window and menu handling. Without them, the language is restricted to the systems programmer who is happy to work with low-level calls.

If Metacomco want to sell the language to home users, rather than just to professional software writers, then a friendlier user environment and some Amiga specific extensions to the language are badly needed.

ERROR NUMBERS

There are three main types of error in programming with a compiler. Compiler errors are picked up by the compiler while its actually compiling your program. These include syntax errors, undeclared variables, and so on. Run time errors occur when you run a successfully compiled program which contains things like division by zero or square rooting negative numbers, causing a program crash. The third type, and usually the hardest to spot, are errors in the program logic. Here the program executes the code you wrote, but what you wrote was not what you meant!

for

- **Separate compilation to linkable modules**
- **Random access file handling**
- **Extensions for dynamic string handling**

against

- **No high-level extesions to handle Amiga specifics**
- **No integrated editor/debugger environment**
- **Complicated compile/link setup**

features 0 1 2 3 4 5

performance 0 1 2 3 4 5

ease of use 0 1 2 3 4 5

manuals 0 1 2 3 4 5

format value 0 1 2 3 4 5

AMIGA TOO

GFA Systemtechnik are currently working on a compiler for Version 3 on the ST. Glentop are expecting to ship out finalised copies by September. An Amiga GFA BASIC Version 3 system is due a couple of months after that. The Amiga compiler will presumably be ready sometime in the new year.

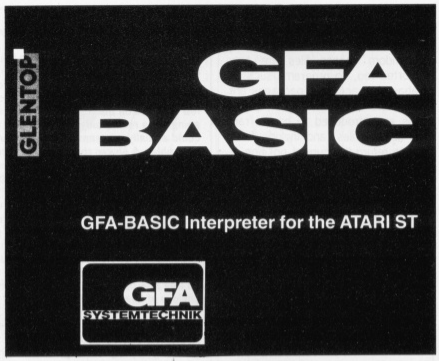
GFA BASIC 3

ST only, Amiga version due November
£64.95 ■ Glentop

With over 50,000 GFA BASIC 2s sold Worldwide, it's not hard to understand why Systemtechnik – or rather Frank Ostrowski – decided to write Version 3. It's not a simple upgrade either, but a complete revamp: greater speed, more commands, bigger and better manual, enhanced editor.

Integration is GFA's forte; program creation, debugging and execution all start from the same place. The editor, of word processor quality, checks the BASIC syntax as you type in commands, indents instructions within loops (FOR-NEXT, DO-LOOP, WHILE-WEND etc) to format them and displays commands in upper case. All worthwhile stuff that takes much of the drudgery out of program development and goes some way to ensuring bug-free software.

Further editing commands let you delete and restore lines of program, mark, copy, move and delete blocks, jump to top or bottom of the program and find and replace instructions. Functions are accessed either via key sequences or from a menu bar at the top of the screen.



Beyond the editor

Other options – like loading and saving files, merging ASCII files, dumping files, switching character sizes (mono only), testing for loop constructions and running a program – are accessible from the menu bar. An immediate or direct mode also exists, but is limited to single-line commands like `PRINT A, DIR, POKE 67860,22` and the like.

Writing programs is one thing, having efficient commands to do specific tasks is another. GFA is crammed with powerful instructions that often replace groups of commands from other dialects of BASIC. For instance, GET and PUT allow software sprites to be manipulated effortlessly, POLYLINE and POLYFILL help you draw pattern-filled shapes very quickly, menu bars and windows can be set up and interrogated with OPENW and ON MENU GOSUB. GEM and the deeper dungeons are well covered, so things WIMP can be handled with confidence.

Upward compatibility

Version 3 can run programs written in older versions of GFA BASIC, but they must be stored as ASCII files and then MERGEd into the new BASIC. After that the normal SAVE and LOAD

VERSION 3 IMPROVEMENTS AND ADDITIONS

The manual – which used to be a 300 page-plus affair containing almost no tutorial – now stands at 500 packed pages. Setting up, program commands and GEM handling are much more clearly explained. However, text is still published on ridiculously bright red paper (try photocopying it and you'll see why – Ed).

Menu bar options have been increased. The most noticeable addition is the Atari symbol at the left edge of the menu which, when clicked, brings up another menu bar. 'Deflist' makes it possible to alter the appearance of the program listing (for example, either the first character in every line, or all commands in the listing, can be forced to upper case automatically). 'New names' tells the computer to check for any new variable being entered – useful when long variable names are in use.

Procedures on the editor screen can be 'folded' (shortened) to just their definition line. The procedure code isn't affected, merely its representation on screen, which makes for short clear listings. Multi-line functions are also supported.

Several existing commands can now take extra parameters, thus increasing their usefulness. TYPE now determines any of 12 variable categories, STR$ can produce a string from a number with extra options for specifying length and decimal place (many other string handling instructions have been boosted in this way). ERASE can delete several specified arrays in one go and ON GOSUB allows multiple branching. ELSEIF, DOWNTO, OTHERWISE, DO WHILE, DO UNTIL, LOOP WHILE and LOOP UNTIL have all been added to complement existing loop commands. Similarly branching has been engineered to include SELECT, CASE, DEFAULT, ENDSELECT and CONT.

A whole new set of bit operations has been brought into force, most of them lifted directly from 68000 assembler mnemonics. BCLR, BSET, BTST and BCHG reset, set, test and negate individual bits, respectively. SHL, SHR, ROL and ROR shift or rotate bits. The method of canoodling with operating system routines is now documented, making it easy to fiddle with GEM, BIOS, XBIOS and AES libraries.

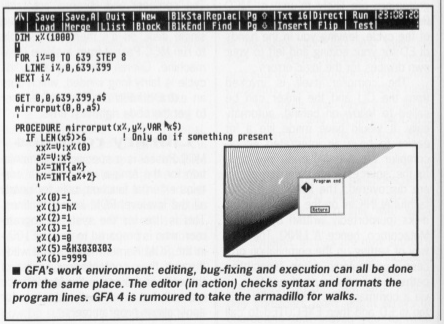
features 0 1 2 3 4 5
performance 0 1 2 3 4 5
ease of use 0 1 2 3 4 5
manuals 0 1 2 3 4 5
format value 0 1 2 3 4 5

for

- Improved 500 page manual
- Procedures can be 'folded' and variables checked
- Speed increase of around 20%
- 99.9% compatible with GFA Version 2
- Better control of GEM

against

- Pity syntax checker can't be switched off
- Demo programs disappointing



■ *GFA's work environment: editing, bug-fixing and execution can all be done from the same place. The editor (in action) checks syntax and formats the program lines. GFA 4 is rumoured to take the armadillo for walks.*

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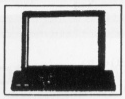

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```
#include <stdio.h>

main(argc, argv)
int argc;
char *argv[];
{  int dummy;
   char c, *infilename, *outfilename;
   FILE *infile, *outfile;
   infilename=argv[1];
   outfilename=argv[2];
   infile=fopen(infilename,"r");
   outfile=fopen(outfilename,"wb");
   printf("Starting...");
   while ( (c=getc(infile))!=EOF )
      putc(c,outfile);
   printf("\nDone\n");
   dummy=fcloseall();
```

■ *Lattice C. The lines involving argc and argv are how C reads filename parameters from the command line. You'd just type COPY FILE1 FILE2 (at the CLI in AmigaDOS or in the command line request box on the ST) to copy FILE1 to FILE2.*

```
PROGRAM COPY(INFILE,OUTFILE,OUTPUT);
TYPE
   CHARFILE = FILE OF CHAR;
VAR
   INFILE, OUTFILE: CHARFILE;
   I: INTEGER;
BEGIN
   RESET(INFILE);
   REWRITE(OUTFILE);
   WRITELN('Starting...');
   WHILE NOT EOF(INFILE) DO
   BEGIN
      OUTFILE^ := INFILE^;
      PUT(OUTFILE);
      GET(INFILE)
   END;
   WRITELN('Done!')
END.
```

■ *The same in Pascal 2*

```
10 PRINT "START"
20 OPEN "I",#1,"D:DUMMY.DAT"
30 OPEN "O",#2,"D:ST.DAT"
40 WHILE NOT EOF(1)
50 A$=INPUT$(1,#1)
60 PRINT #2,A$;
70 WEND
80 CLOSE #1
90 CLOSE #2
95 PRINT "STOP"
```

■ *Standard ST BASIC*

```
Print "Start"
Open "i",£1,"d:dummy.dat"
Open "o",£2,"d:dummy1.dat"
While Not Eof(£1)
  A$=Input$(1,£1)
  Print £2,A$
Wend
Close £1
Close £2
Print "done"
```

■ *GFA BASIC*

```
INPUT "Input file:";ifile$
INPUT "Output file:";ofile$
OPEN "I",£1,ifile$
OPEN "O",£2,ofile$
PRINT "Starting..."
WHILE NOT EOF(1)
  c$=INPUT$(1,£1)
  PRINT £2,c$;
WEND
PRINT "Done"
CLOSE
```

■ *Standard Amiga BASIC*

■ *The program code we used for the file copying benchmark test. You can see how the different programming languages treat files:*

commands can be used.

Version 3 contains all the commands of earlier versions, although there are minor differences which may make some modifications necessary. The differences include: MUL/DIV in Version 3 work with integer variables and parameters only. PRINT USING only displays numbers that fit in a specified format; wrong values may be displayed in preference to incorrect formats. KEYPAD requires a KEYPAD 0 command after keypad, alternate or control keys are interrogated. MOUSEX and MOUSEY cause negative co-ordinates if windows are active.

Conclusion

Traditionally, speed – or lack of it – has been the reason for programmers choosing languages other than BASIC to create games and business utilities. GFA gives the lie to this for many operations, as it is faster than a good few compiled high-level languages. GFA's wealth of variable types (boolean, byte, word, integer, float and string), memory management and sophisticated instructions make sure that it is always one of the fastest programming languages around. GFA 3, Others Nil.

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THE ACID TEST

Okay, benchmarks are hoary old things at the best of times, but nevertheless a few simple tests can illustrate general trends. We ran three test programs through each of the compilers on review, and also through ST and Amiga BASIC for comparison.
1 – A simple program to print "Hello world!" on the screen. This tells you the size of the smallest program you can practically get.
2 – A loop of 100,000 floating point divisions (calculating Pi, if you must know) to test arithmetic speed. We tried to get the best out each system – compiling with run-time checks taken off, etc. Lattice C actually does double precision arithmetic faster than single!
3 – A character-by-character file copy program copying a 53k file, to test file i/o function efficiency. This was run from and to RAM disk to minimise the difference between ST and Amiga disk access times.

Compilation times were measured with all files and libraries on floppy disk. If you have a 1040/Mega ST you'll get a vast increase with everything in a RAM disk.

Don't take these figures as absolute gospel; there may be some cases where Pascal is faster than C, for instance, and don't think GFA BASIC is fastest for all number crunching; but we reckon these tests cover most simple applications.

	"Hello world"			100000 f.p. divs			53k character copy		
	compile &link	*code size*	*run time*	*compile &link*	*code size*	*run time*	*compile &link*	*code size*	*run time*
Lattice C 4.01 (Amiga)	*61s*	*7.4K*	–	*77s*	*12.2K*	*26s①*	*67s*	*7.8K*	*3s*
Lattice C 3.10 (Amiga)	*87s*	*10.2K*	–	*99s*	*14.8K*	*26s①*	*98s*	*13.2K*	*3s*
Lattice C 3.04 (ST)	*190s*	*9.2K*	–	*192s*	*14.1K*	*22s①*	*179s*	*11.5K*	*3s*
Pascal 2 (Amiga)	*52s*	*8.3K*	–	*59s*	*13.3K*	*36s*	*58s*	*10.2K*	*53s*
AmigaBASIC	–	*103K②*	–	–	*103K②*	*101s*	–	*103K②*	*242s*
ST BASIC	–	*128K②*	–	–	*128K②*	*166s*	–	*128K②*	*274s*
GFA BASIC 2 (ST)	–	*57K②*	–	–	*57K②*	*48s*	–	*57K②*	*405s*
GFA 2 compiler	*11s*	*2.2K*	–	*11s*	*4.1K*	*18s*	*11s*	*4.8K*	*360s*
GFA BASIC 3 (ST)	–	*92K②*	–	–	*92K②*	*31s*	–	*92K②*	*262s*

① *Using double precision arithmetic*

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GRAPHICS

DELUXE PHOTOLAB

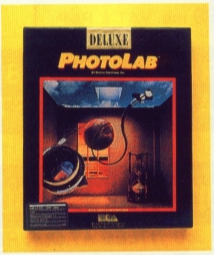
When Electronic Arts released the phenomenally successful *Deluxe Paint II* art package they gave themselves a bit of a problem: how on earth do you follow that? The answer, it seems, is *Deluxe Photolab* – Ben Taylor picks his way through the pixels.

£69.95 ■ Amiga only, requires 1MB
Electronic Arts ■ 11-49 Station Road, Langley, Slough, Berks SL3 8YN (0753 49442)

BRUSH OFF

ST owners may be a little puzzled at the use of the word 'brush'. At the simplest level, a brush is much like its equivalent in an ST package like Degas Elite – you can click on menu choices to change the drawing cursor to a circle, square, spray, or whatever. However, on the Amiga you can also outline any area of the screen, no matter how large, and use that as a brush. This is how Amiga paint packages implement moving and copying parts of a picture – define it as a brush and redraw the whole area at its destination. Massive areas of colour can be moved around really fast by the Amiga's famous blitter chip.

What you get for your money with Deluxe Photolab is three separate programs, designed to complement one another. First and foremost is a paint package which can work in any Amiga graphics mode; second is an image processing utility program called *Colors* (English translation: *Colours*) to convert pictures from one screen mode to another among other things; and finally *Posters* prints out your pictures as a mosaic of up to 10 foot square!



Photolab Paint

Photolab can work in any of the Amiga's screen modes. When you first run it you are presented with a menu screen offering any mode from low resolution (320 by 200) to high resolution interlaced, and most importantly the 4096 colour HAM mode. You can also select how many 'bit planes' to use: 1 bit plane gives you 2 colours (black plus another), 2 planes 4 colours, 3 planes for 8 and so on, subject to the limitations of the current mode.

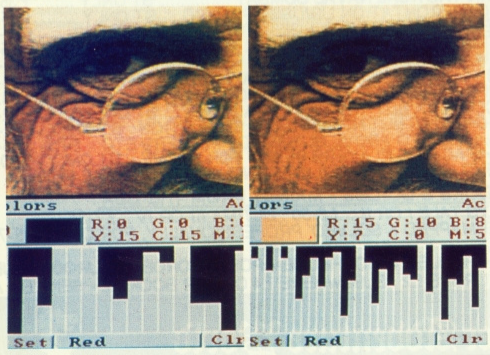
Users of Deluxe Paint will immediately feel at home with Deluxe Photolab. It uses many of the Electronic Arts standard conventions – define a brush with the right mouse key to move it, or the left mouse key to copy it, use the space bar to halt any operation, and so on. The colour palette is displayed on screen and also on a separate palette editing screen – you can specify a colour by eye, or by choosing Red/Green/Blue or Hue/Saturation/Variance values. You can also specify start and end colours and ask for a smooth sequence of shades to be created between them.

You can define brushes in the usual Amiga way to copy areas of the screen around; in HAM mode brush redrawing is very slow, and you can't sweep a smooth line. This is because HAM brush work is done under software control, not by the blitter. One excellent bonus is that you can transport brushes between different mode screens – define a brush in 4096 colour HAM interlace mode, and you can go to a low resolution image and paste it in. The conversion is done for you.

A new feature in the Deluxe armoury is 'Brush Warping'. Once you've defined a brush, you can draw any outline you like – a regular or freehand shape – and the brush is stretched to fit it. Squeeze a brush into a circle and you'll give the impression of things trapped in a bubble, for instance.

Another powerful feature is shade control. When drawing any shape to be filled, you can ask for the filling to be graduated. You can define a 'hotspot', where the fill colour is solid, and it tails away as you go radially outwards. You can adjust how fast it tails off, and you can also 'dither' the shading so it either looks like contour lines (no dither) or is a smooth mix (loads of dither). There is, however, no support for ray tracing – in Photon Paint you can ask for a scene to be highlighted as though there was a light source at a given point.

All the regular paint features are also present, of course. Magnify



■ ***Changing screen modes with the 'Colours' utility. On the left, a digitised picture in HAM mode, on the right the ordinary low resolution version. The conversion is impressive.***

■ *'Brush Warping' is a new feature for the Deluxe series – here we've twisted Duncan Goodhew into all manner of shapes.*

mode shows you both enlarged and normal size screens at the same time; brushes can be rotated and resized as you like; the undo seems very good and covers almost everything, including fills that have gone awry. There are more paint modes than there are adverts for cellphones in the Sunday Times Magazine – Solid, AND, OR, Blend, Mix, Max, Min, Add, Subtract... together, they give you the power to mix pixels in any way you like. Images can be anti-aliased as they are resized, to smooth any 'jaggies' out, and you can turn areas of a picture into glorious Black and White if the urge takes you.

Colors

Colors gives you a whole load of useful image processing functions that presumably couldn't be fitted into memory at the same time as the paint program.

First, it can convert any resolution picture to any other. It tries its damnedest to do the best possible job, and even converting a 4096 colour HAM screen to a low resolution image you'd be surprised how good the results are. You can produce sepia-toned monochrome images for that antique feel, or turn the colours into a negative image for that just-exterminated-by-a-Dalek look (*very 60s – Ed*).

The second main use is in palette swapping and adjusting. If you've drawn a picture using all 16 colours available to you in high-resolution mode, and desperately need another colour, you can ask Colours to remove one or more colour registers. It counts the pixels and redraws the whole image using less registers, having adjusted the colours so the change can hardly be noticed. You can also ask for one picture to be redrawn using a palette compatible with another picture's.

Finally, you can resize pictures. American Amigas can only display 200 pixels vertically (400 in interlace mode), so any art files you find on public domain disks won't fill your 256-line UK screen. Now to be sure you could use the paint package to stretch the image to fit, but that usually leaves jagged edges. The Resize function of colours recalculates pixel positions in a much more pleasing way, and really gives good results.

Posters

Posters completes the Deluxe Photolab trio, providing a utility to print pictures out at any size. You can choose the paper to be Portrait or Landscape (ie, printed tall and thin or short and fat) – Landscape is a better approximation to the screen size. You can spread the picture up to 10 foot square over 200 sheets of paper, and Posters will calculate the page breaks and print the image out for you to paste together. Just think though: 200 sheets of high quality graphics could take 15 hours or more, not to mention getting through a dozen of those good old Okimate waxed colour printer ribbons!

Photolab comes with the Workbench 1.3 printer drivers, so there is direct support for 24 pin printers, and in theory all the printing works a bit faster.

A500 VIEW

If you're a 0.5 megabyte Amiga owner drooling with envy at all this resolution-switching and colour processing, there is still hope for you – a neat program called *Butcher II* (£27.00) offers some of the same facilities as Photolab's *Colours* utility, particularly in converting images from one resolution to another. Further details from the Amiga Centre Scotland (031-557 4242).

AMIGA SCREEN MODES

The Amiga has half a dozen different screen modes. On UK machines, low resolution is 320 by 256 pixels, and can use 2, 4, 8, 16 or 32 colours. High resolution is 640 by 256 pixels, with up to 16 colours. In addition to this, you can run the machine in 'interlace' mode which doubles the vertical resolution to 512 pixels, making a much squarer image. However, unless you have a long-persistence phosphor monitor, interlace mode screens flicker quite noticeably.

The Amiga only supports 32 colours directly, but there is a trick which allows you to double this called EHB mode ('Extra Half Brite'). Normally, 5 bits per pixel gives you 32 colours; EHB uses 6 bits for 64 colours, the extra 32 colours being the same as the first 32 except at half intensity. (Some early Amiga 1000s don't support EHB mode.)

So far, this doesn't sound exceptional. The reason the Amiga is such a stunning graphics machine is that there is another mode called HAM ('Hold And Modify') which can display all 4096 possible colours at once on a high resolution screen. HAM uses 5 or 6 bit planes giving 240 or 4096 colours. The secret is that a pixel can be set up to use the colour of the pixel next to it, but with one of the red, green or blue components modified.

For you?

Deluxe Photolab is simply the best argument there has been for expanding your memory to a full 1MB. It takes a powerful paint program which leaves everything else standing (including Photon Paint) and combines it with an invaluable set of image processing tools in *Colours*. Coupled with a digitiser, this is the way to push the Amiga's screen to its limits.

for

- Paint package works in all screen modes
- Can work on images bigger than screen size
- Brushes can be stretched to fit any shape
- 'Colours' utility converts images between resolutions
- Excellent manual with tutorial examples

against

- Won't run on unexpanded A500 (needs 1MB)
- No light source processing

features 0 1 2 3 4 5

performance 0 1 2 3 4 5

ease of use 0 1 2 3 4 5

manuals 0 1 2 3 4 5

format value 0 1 2 3 4 5

PATCHING THINGS UP

Many people know of MIDI as a musical interface standard for tying instruments, effects units and micros together. It can also be used to transfer the actual *sounds* of the instruments, though, as Chris Jenkins explains.

We'll assume you realise that your ST or Amiga can become the centre of an electronic music system which would make musicians of as little as five years ago collapse with envy. With the help of MIDI, affordable computers like the ST and Amiga have found a place in every sort of music studio from four-tracks in Finchley to digitals in Detroit.

But are you aware of all the possible musical applications for your computer?

MIDI music software for the ST and Amiga falls roughly into three categories. By far the most popular and immediate is MIDI sequencing, by which performances on MIDI synthesiser keyboards and other instruments can be recorded, edited and re-arranged. At the more exotic end of the spectrum are packages to automate the mixing process, print out music scores or create sounds by harmonic synthesis. In the middle, the application which attracts most attention after sequencing, is patch editing.

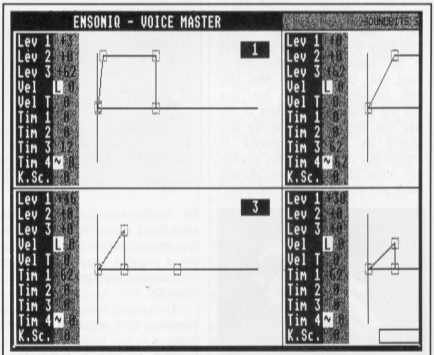
In the beginning...

The original synthesisers bristled with knobs and switches, one for each sound parameter such as filter settings, envelopes, waveforms and modulation. This hardware was expensive and unreliable, and didn't allow sounds to be recreated after use, except by painstakingly re-aligning all the settings. The logical step was to put sound creation under digital control. Practically every modern synth since the Yamaha DX7 uses 'digital access' editing. This means that with the help of an LED or LCD display, and a slider or numeric pad, you select the number representing the sound parameter you wish to edit and enter a new value for it, which is stored in memory. A complete sound patch can then be assigned an internal memory position, recalled for use at any time, and in most cases re-edited to later requirements. Some synths store as many as 256 sounds on board, with more on relatively expensive cartridges or memory cards.

Digital access editing is cost-effective and reliable, but can be hideously slow, especially with complex synths which can have over 200 sound parameters.

Patch editing software restores the visual aspect of sound creation, allowing you to see the status of all the synth's sound parameters on your display. Amplitude and filter envelopes can be represented as graphs to be manipulated on-screen, and impenetrable functions such as Yamaha FM algorithms make much more sense when shown in graphical form.

Patch editing software also makes available facilities like semi-random patch creation, and in some cases the conversion of sounds from one synthesiser to another. Another advantage is the possibility of storing all your sounds on cheap floppy disks rather than expensive hardware cartridges. You can manage to cram almost 2000 DX7 sounds on one £1.50 blank disk; compare the expense of storing that amount of data on cartridges at around £70 for 256 patches! You can end up saving a



■ *Soundbits Ensoniq ESQ/SQ80 editor*

SOUND SAMPLE

Digital synthesisers produce accurate representations of acoustic sounds by 'sampling' them. This technique is akin to making a digital 'recording' of the sound and storing it in memory or in disk.

THE ART OF NOISE

Like many musical software applications, patch editing has its own jargon, which can often be traced back to the earliest synthesisers.

When Bob Moog developed the voltage-controlled oscillators, filters and envelope shapers which made practical synthesisers possible, electronic circuitry was bulky and limited. The first synths were 'modular', constructed from separate components, each linked together by 'patch cables'. Each different noise would require a different pattern of connections and potentiometer settings.

Later synths used pin-matrices instead of patch cables, and eventually the whole process became digital. With the introduction of the Sequential Prophet-5 and other polyphonic programmable synths, all the sound modules were hard-wired together, and the switch settings and sound parameters were stored in editable digital memories. Despite this, the phrase 'patch', meaning a particular group of sound settings, remains in use.

good deal of money, despite the initial cost of patch editing packages at £50-£100.

Because the ST's built-in MIDI facilities made it the obvious choice for most musicians, it's way above the Amiga in the patch editing charts. Fortunately, several US companies are making amends, and we should see much more Amiga-specific software soon.

Synths and sounds

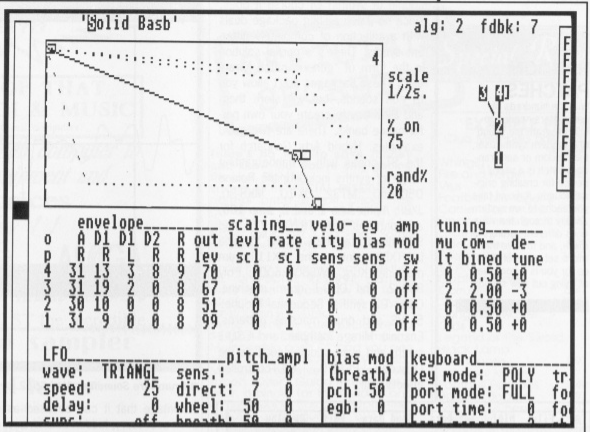
Most patch editing packages cope with only one type of synth (or very closely related models such as the Yamaha DX7 and TX7). Obviously the best-known synths, like the Yamaha DX7/100/21/27, TX 81Z, Korg DW8000, Ensoniq ESQ-1, Casio CZ series and Roland Juno and D50 series are also the best supplied with editing packages. It's quite possible to find suitable packages for the most obscure Oberheim, E-Mu, Korg, Sequential, Seil or other MIDI synths, though, if you enquire with specialists such as Square Dance Audio or Triangle, or scan the small ads in American magazines such as Keyboard.

One popular target for editing packages is the Roland MT-32. This powerful keyboardless module is a multi-timbral unit, using the new and flexible Linear Arithmetic sound synthesis system. It has built-in PCM sampled drum sounds, and a digital reverb, but presents one small problem if you want to edit its sounds; you can't! Though MT-32 sounds can be edited via MIDI, it has no front-panel editing controls built-in.

One excellent option is *Patchbox 32* from Tigress Designs. It runs on the ST, was developed by the team behind the popular *Iconix* software sequencer, and comes complete with a software manual and a book on programming the MT32. Patchbox makes full use of GEM, and allows you to edit the MT32's 128 preset sounds, 64 user programmable sounds, and PCM-sampled drum sounds. Like many patch editing packages, Patchbox allows you to define new envelope shapes by picking up a break point and dragging it to a new position.

A popular alternative is the *Caged Artist MT32 Librarian/Editor* from Dr. T. This American package offers auto-generation of sounds. If you let the computer take over completely, the resulting sounds will probably be unusable, but by defining a "mask" setting you can leave some parameters unaltered and have more control over the result. There's also a routine to convert sounds from the more powerful D-50 to the MT-32, within the MT's limitations.

Synthworks, from sequencer heavyweights Steinberg, throws in a 10,000-note sequencer along with the MT-32 editor. It features an advanced filing system by which you can search for sounds using keywords, rather than having to load, transfer and test a whole diskful to find the ones you want. There's also a *Synthworks D-50/550* for Roland's flagship synthesiser. This lets you work on four sounds simultaneously, copying parameters from one to another or merging them to form one complex patch.


'Solid Basb'
alg: 2 fdbk: 7
scale 1/2s.
% on 75
rand% 20
envelope scaling velo- eg amp tuning
o A D1 D1 D2 R out levl rate city bias mod mu com- de-
p R R L R R lev scl scl sens sens sw lt bined tune
4 31 13 3 8 9 70 0 0 0 0 off 0 0.50 +0
3 31 19 2 0 8 67 0 1 0 0 off 2 2.00 -3
2 30 10 0 0 8 51 0 1 0 0 off 0 0.50 +0
1 31 9 0 0 8 99 0 1 0 0 off 0 0.50 +0
LFO pitch_ampl bias mod keyboard
wave: TRIANGL sens.: 5 0 (breath) key mode: POLY
speed: 25 direct: 7 0 pch: 50 port mode: FULL
delay: 0 wheel: 50 0 egb: 0 port time: 0

■ *Dr.T 4-operator DX editor*

Again, D-50/550 and ST owners are spoiled for choice; there's also Dr. T.'s *D.E.50*, which stores two banks of sounds in memory at the same time. You can edit patches manually or semi-randomly, and swap sounds from one bank to the other, building up your own performance sets for live or studio work.

Bits of sound

One of the most active companies in the field is SoundBits. There are *VoiceMaster ST* editors for the Roland D-50 and Alpha Juno 1/2, Ensoniq ESQ-1/SQ-80, Yamaha 4-operator synths (DX100/21/27/11 and TX81Z), and for the new Kawai K1. Retailing at around £80, these packages offer a good selection of facilities at reasonable prices. Most include full GEM operation, randomising, graphical display of envelopes, sound testing, and good disk filing routines. Many synths do not allow you to name sounds on board – their LED or LCD displays aren't large enough to make it possible. In this case it's incredibly helpful if your patch editing software lets you assign a meaningful name to each voice, then store the banks of patches under a file name, say that of the song you're working on.

Another range of ST editors comes from Hybrid Arts. The Android series, including *CZ-Android* and *DX-Android*, offer both numeric and graphic editing, randomisation and storage of over 3,000 patches per disk.

Doesn't this all start to get a bit expensive if you have more than a

MORE SOUNDS

A 'polyphonic' synthesiser is one which can produce more than one sound at once, allowing you to play chords, for instance. Multi-timbral synthesisers can assign different sounds (patches) to individual notes.

PATCH EDITING AND MIDI

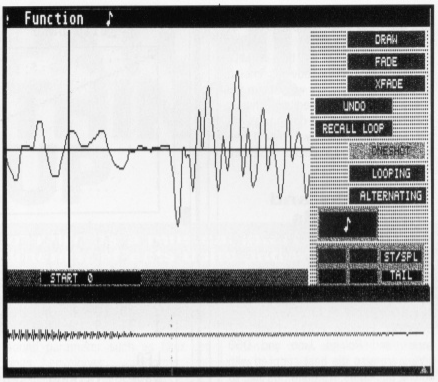
MIDI was originally designed purely to exchange digital music information, such as pitch, note lengths and performance parameters including vibrato and pitch bend. But, because the MIDI format is digital and open-ended, new capabilities can be incorporated into it all the time. One of the first was patch exchange; the patch data is stored in "packets", and single patches, or an entire bank of say 64 patches, can be transmitted by MIDI to a compatible synth, or to a computer for editing.

The latest developments in the MIDI format include standards for the transfer of sound samples. Obviously, as sampling standards become higher, the amount of data in each sample becomes greater – far greater than the amount involved in transferring a digital patch. In this case the speed limitations of MIDI begin to show themselves, and for this reason many professional sampling devices now incorporate SCSI (pronounced "scuzzi"), the Small Computer Standard Interface, which allows sample data to be transferred at more realistic speeds.

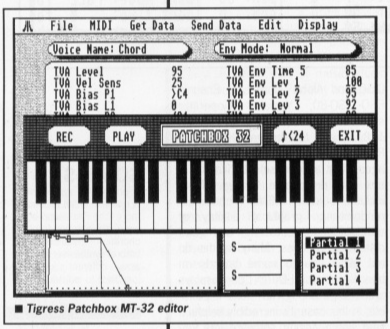
RANDOM PATCHES

With the hundreds of parameters needed to fully program the sound of a modern synthesiser, the random or semi-random patch is a useful device for creating original sounds. It would take you aeons to run systematically through the variations different settings make, and to have the micro set some of them up for you is a good way of trying out new sounds.

couple of synths? Of course it does, since no patch editing package deals with a selection of completely different synths. There's a partial solution in the form of "generic patch librarians". These packages don't allow you to edit sounds, but will store them and allow you to create your own performance banks. There are two good examples. Hybrid Arts *Genpatch* for the ST copes with a flabbergasting range of synths including the Roland D50/550, MT32, JX-10, MKS-80, JX8P, Alpha Juno 1 and 2, Juno 106, and patterns from TR707, 727 and 909 drum machines, all the Yamaha DX/TXFB synths, the RX11 drum machine, Korg DW8000/6000, Poly 800/2, and DDD-1 drum machine, Casio CZ synths, Sequential Prophet-5, VS and drum machine patterns, Ensoniq Mirage sampler and ESQ-1 synth, and even oddities such as the Lexicon PCM70 MIDI-controlled effects unit!



■ *Drumware Soundfiler Akai S612 sample editor*



■ *Tigress Patchbox MT-32 editor*

A cheaper though less flexible alternative is *OmniBanker* from Paradigm. This handles only (!) the Ensoniq ESQs, Yamaha FM synths and RX drum machines, and Casio CZ synths, but it is half the price of the Hybrid Arts package. It also has the advantage that it can be used as a desk accessory, hidden behind, say, a sequencer program, and pulled out each time you need to load new banks of sounds into your synths.

Free samples

Of course, it's also possible to use software packages to edit sound sample data. One of the most advanced such packages is Digidesign *Softsynth* for the ST.

Softsynth creates sound waveforms using a principle called harmonic synthesis. You define the waveshape, envelope and frequencies for 32 software "oscillators", then transfer the result by MIDI into a sampler such as the Akai S900. Although it's difficult to make your sounds come out the way you intend, you can create some weird and wonderful effects by mistake! A bonus is that Softsynth can also simulate an FM (Frequency Modulation) synth, using one oscillator to modulate another in the same way the Yamaha DX synths do. A similar package from DrumWare, *GenWave*, will transfer files from one 12-bit sampler to another.

Less generic sample editing packages include *Oasis* from Hybrid Arts. This allows you to display waveforms from the Ensoniq Mirage sampler, loop them automatically or manually, add, copy and invert samples, add fades, and create up to 64 keyboard split points each with independent velocity and looping parameters. There's also the *ST Sonic Editor* from Drumware for the Akai S612 and S900, and Steinberg's *Soundworks* for the Akai S900 and other samplers.

Amiga advancing

So what's the situation for the unjustly neglected Amiga? Many of the packages we've mentioned for the ST are slowly making their way to the Amiga, but getting hold of them is another matter; there are as yet few UK importers of Amiga music software.

Fortunately, things are looking up with the establishment of an international branch of the American software group MusicSoft. Apart from handling the existing SoundBits products, MusicSoft also has a range of Amiga products planned. The first will be an MT-32 Editor/Librarian.

With any luck we'll also have a chance to see some of the latest Amiga products from the US before Christmas. SoundQuest have *Master* editors for the Roland D-50, MT-32, Yamaha DX7II, DX7, and TX81Z/DX100/21/27, Ensoniq ESQ-1 and SQ-80, and Casio CZ synths. There's also an Amiga generic librarian. Costs are around $150 per package, which might mean around £150 by the time someone's gone to the trouble of importing them! Another disadvantage is that you need an Amiga with 1 meg of memory to use all the facilities of the SoundQuest packages.

The *Music-X* package from Microllusions promises much more than patch editing; it's a combined sequencer, keyboard controller, SMPTE/MIDI synchroniser, patch librarian, and sound editor. With a little technical knowledge Music-X also lets you write patch editors for any synth. I'll believe it when I see it!

As MIDI synthesisers become more and more powerful, and more and more controls are cut off to meet demands for lower costs, the ST and Amiga are becoming more necessities than luxuries in the music studio.

CONTACTS

C-LAB, c/o Sound Technology, 6 Letchworth Business Centre, Avenue One, Letchworth, Herts, SG6 2HR, 0462 480000
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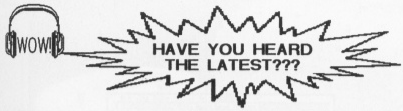

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HOME ACCOUNTS

Keeping track of your money can be a complex business these days what with HP, credit cards, cash cards and so on, not to mention standing orders of varying frequencies and amounts. Pat Winstanley tots the points up for Digita's home accounts package.

ST version reviewed, Amiga version due in August

£39.95 ■ Digita International, Kelsey House, Barns Road, Budleigh Salterton, Devon EX9 6HJ (0395 45059)

Home Accounts aims to provide you with a simple method of keeping track of your monthly budget. It's intended for home use, and as such prefers simplicity to full big-business accounting functions. The disk and glossy 40 page manual cover the program itself and a very short demonstration file with just a couple of entries to show the format and commands used.

The system can handle up to 12 months' data per file with 13 different accounts and up to 60 expenditure types. Up to 100 different standing orders may be entered and 360 transactions for each account which should be enough for even the most compulsive spender.

Having backed up the disk, loaded the program and set the date, your first task is to feed in details of the various accounts you will be working with eg. current, deposit, credit card etc. Up to 13 accounts may be defined each having space for account number, name and type and a two letter code by which the program will recognise it.

Setting the scene

Other account details include the optional setting of minimum and maximum balances for the account which could be useful for maximising interest received from savings accounts and avoiding going overdrawn. The last option allows you to set an opening balance for the account. Additionally you may call up a 'memo pad' where extra details can be recorded as notes. These are ignored by the system but can be very handy.

Next you need to define the various types of transaction, giving each an abbreviated code for the system to recognise. This will be used later if you want to take advantage of the optional budget facilities. Each type of expenditure is given a unique code such as MORT for mortgage, ELEC for electricity etc.

Having defined all your accounts and types the next step is to set up transactions for each. These are divided into *regular* and *manual* entries and each is treated differently by the system. Regular transactions are those entries which are known in advance both by payment date and amount. Thus standing orders for mortgage, gas etc. will go here. You may also have a regular transfer of funds from one account to another, say for savings, salary or housekeeping. There is also space to make comments which will be shown on later reports.

Manual transactions are used for cheques, variable salary, cash withdrawals etc. Since these are not known in advance they must be entered (or 'posted', in accountants-peak) posted as and when they occur. They are set up in much the same way as regular transactions but are posted to the accounts to which they apply rather than details for all accounts being mixed together. An additional facility is available whereby transactions may be marked so that they do not appear in the final report until they have also appeared on the bank statement. This allows unpresented or uncleared cheques to be seen at a glance.

The posting of transactions to the various accounts is performed automatically by the system. It works on the basis of the difference between the date that the file was last saved and the date you feed in as current. Any transactions in the files which are dated in between will be

RECONCILIATION

Reading a bank statement can be a confusing experience until you learn that recent cheques and deposits may not yet have made it through the clearing system. To find your real position simply tick each debit on the statement against your cheque stubs and standing order list, and credits against wage cheques etc. Then knock any unpresented cheques off the balance and add on outstanding deposits to find your true position.

Desk File System Account Edit Report

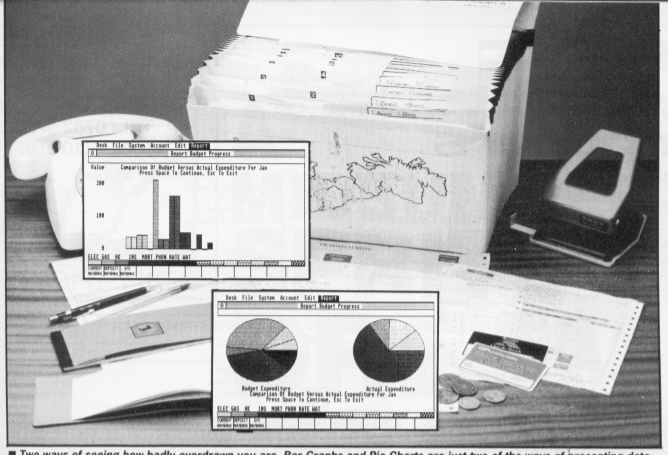
Regular Transactions

Start Date	Exp Date	Type	F	From	To	Details	Debit	Credit
31 Dec 87	22 Jan 88	RATE	M	SO		gen rates	43.00	
31 Dec 87	1 Jan 88	WAT	Q	SO		water rates	20.00	
1 Jan 88	1 Dec 88	TRAN	M	CA	SO	transfer	500.00	
1 Jan 88	1 Dec 88	TRAN	M	CA	DA	savings	50.00	
1 Jan 88	1 Dec 88	SAL	M		CA	salary		750.00
4 Jan 88	4 Dec 88	PHON	M	SO		phone	50.00	
12 Jan 88	12 Dec 88	INS	M	SO		insurance	30.00	
15 Jan 88	15 Dec 88	ELEC	M	SO		electric	35.00	
21 Jan 88	21 Dec 88	GAS	M	SO		gas	42.00	
27 Jan 88	27 Dec 88	MORT	M	SO		mortgage	155.00	
1 Apr 88	1 Oct 88	WAT	Q	SO		water rates	22.00	
22 Apr 88	22 Dec 88	RATE	M	SO		gen rate	47.00	

⇧ ⇧ EXIT Update Enter ⇩ ⇩

CURRENT ANYBANK | DEPOSIT ANYBANK | S/O ANYBANK

■ *Setting out your regular payments – standing orders – in Home accounts*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Report Budget Progress
Value Comparison Of Budget Versus Actual Expenditure For Jan
Press Space to Continue, Esc To Exit
200
100
0
Budget Expenditure
Comparison Of Budget Versus Actual Expenditure For Jan
Press Space to Continue, Esc To Exit
Actual Expenditure

■ *Two ways of seeing how badly overdrawn you are. Bar Graphs and Pie Charts are just two of the ways of presenting data in reports.*

SEEING DOUBLE

Home Accounts uses 'double entry bookkeeping', which for the uninitiated is simply a matter of balancing a credit in one account with a debit in another. Thus a cash point withdrawal debits your bank account and credits the cash account in your pocket, while salary paid into your bank credits that account and debits your employer's bank. A new ST debits the housekeeping and credits the hardware stock account!

applied to the accounts to which they relate to produce an up to date balance.

Now the news

Of course, all this work would be for nothing unless the results of all the transactions could be shown, and Home Accounts has a comprehensive reports service.

Any account can be presented in the form of a bank statement either to the screen or printer. You can choose whether or not to include unreconciled transactions such as unpresented cheques, which months to display, and even which types of transaction should be included.

Another option is the facility to search for and display any transactions whose details you define according to the comments you've entered in the files. Thus you could list all the cheques you have made out to a computer shop by making sure that the details of each such transaction contained the name of the shop then asking the program to search for that name. Wildcards are also available to match any character(s).

It's easy to forget the exact codes used to refer to different types of expenditure so these can also be listed either to the screen or printer, as can a list of all regular transactions for the month.

The manual is divided into three sections, first a general look at the capabilities and limits of the system with notes on computer terminology, backing up data and getting started followed by a step-by-step section on how each feature is used. The third section goes into more general detail of the different features. Although all necessary information is included, being aimed at the home user a little more theory on bank reconciliations and double entry would have been advisable.

Operating the system is fairly straightforward. The mouse is used to select options from pull-down menus while [Tab] or the mouse pointer are used to place the cursor where required. Some of the editing screens allow-list scrolling by means of video player style controls. On the whole I found the controls easy to learn and very positive, except for rather sluggish mouse button response at times.

At the end of all this, it's even possible to load just part of a file as a template, say at the year end when all you really want are the regular transaction details together with opening balances.

The bottom line

Although intended for the home user, the program is equally suitable for (very) small businesses, clubs, charities and education. You will find it far quicker to use paper and pencil for general bank reconciliations etc., but the budget progress reports are definitely useful to see where the spending goes, and much faster than manual methods. It would have been nice to see some form of simple spreadsheet facilities rather than a static budget account, and such an addition would round the package out. For me it stops just short of being a Really Useful Engine but good value if you're more interested in keeping records than juggling finances.

WHERE'S ALL THE MONEY GONE?

Are you one of those people who can budget their income and expenses to the last penny, never deviating from the set plan? If so, you aren't going to be needing Home Accounts anyway. But if you're one of the vast majority whose actual outgoings never quite seem to match your budget, then there's a useful facility for you:

Using the codes which were set up earlier you can set up a budget for each type of expected expenditure for the whole of the accounting period. Then when all actual transactions have been posted to the relevant accounts you can ask the program to tell you just where and by how much your spending has varied from the budget. The reports can be shown as a list of absolute figures, a bar graph or a pie chart. The pie chart is useful for showing what proportion of the total expenditure is taken up by different categories, although classing computer expenditure as housekeeping probably won't fool your partner for long.

Each month of the accounting period is shown separately so it's easy to see where things have gone wrong. Strangely, while the representation of amounts is in different coloured patterns on the charts, the key to types is shown in black and white patterns which are indistinguishable from each other. While different types can be worked out by counting along the key on the bar graph, this just isn't possible with the pie chart.

The graphics cannot be sent to the printer directly, but may be dumped using the [Alt] and [Help] keys.

for

- Very quick after initial data entry
- No frills to confuse the home user
- Simple controls

against

- Concepts poorly explained for the uninitiated
- Graphics difficult to print/distinguish
- Budget shows what you shouldn't have spent!

features 0 1 2 3 4 5

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GRAPHICS

A MIDSUMMER SPRITE'S DREAM

If you're a graphic artist, how do you go about designing the characters and backgrounds for a game? And what features do you need in your art package to do it? Nigel Brownjohn, designer of the soon-to-be-released ST *Verminator* from Rainbird, explains a little of the production process behind a major game's graphics.

Providing 16-bit software is a very mixed business. The sense of achievement when a product is released is undeniably euphoric; however, the confident smiles of the production team concerned can mask shattered nerves and a degree of disbelief that the product was ever finally finished.

This is not usually the case with 8-bit games, but the call for depth, value for money and originality of 16-bit software can lead to endless months of worry and backbreaking work in all departments. For a reviewer to sit down and write an article that damns a piece of games software is fair enough, and I'm afraid many games deserve such reviews, but to blindly damn the production team into the bargain without bothering to ask them why they think their product is a little weak in certain areas seems unfair. When a game falls short of the mark it is not necessarily due to a company trying to rip the public off, as some articles would have you think.

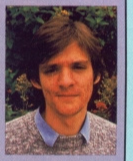
Problem page

To produce a piece of games software in theory is relatively simple; in practice this is definitely not the case. When designing a game it is best to take into account that any small thing that can go wrong will go wrong! Money problems, ill health, unforeseen difficulties and an army of other gremlins all seem to appear as soon as a project gets under way. If the production team doesn't care about the game they're creating, then many of these problems don't occur and the production time is relatively short and uneventful. Producing bad games is easy!

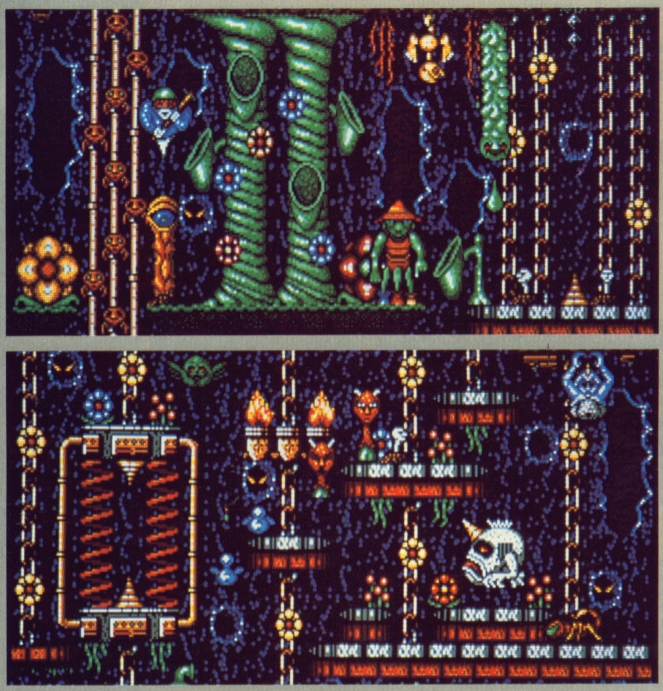
The best 16-bit games appear to be those which have had a year or two's work put into them. I think this is evident in games such as *Elite* or *Dungeon Master*. The progression of games software onto the more powerful machines with their increased graphics potential has likewise increased the relevance of the graphic artist; shoddy graphics are no

■ *'Demon', one of Brownjohn's more sinister designs!*

■ *Nigel Brownjohn is a freelance graphic artist. His early successes included the graphics for 'Everyone's a Wally', 'Herbert's Dummy Run', 'Hijack' and*



'Ice Palace'. His first ST project was 'Metrocross', and a lot of his time recently has gone into the forthcoming and highly original 'Verminator' for Rainbird.



■ *Two scenes from 'Verminator', Brownjohn's forthcoming game from Rainbird. It's a wacky graphic adventure where you play a three-legged council Refuse Collector with a brief to clean up the levels of Dendra, a microscopic parallel dimension with more than a passing resemblance to the inside of a tree! Only this tree has stores, casinos, banks, a mafia and a host of mutated lifeforms. The aim is to become rich and successful and there's a number of ways of going about this. You can kill pests all day – with your hammers, bricks, lasers and cluster bombs – to earn money the hard way, or you might try becoming a vigilante by taking on the many muggers you encounter. Alternatively, you can arrange incredible overdrafts with both the bank and the Mob and simply refuse to pay them – thereby setting yourself up as a killer of the ominous debt collectors. Or you can simply spend all your time in the casino and gamble your way to the top. Sounds a bit like life, eh?*

A LIFE IN THE DAY OF A GAME

The work involved for the graphic designer naturally varies depending on the nature of the game. If I've been commissioned to do a conversion of an 8-bit game, then I'm usually just taking the original graphics and redrawing them to a higher quality, so I'm given very clear goals to aim at.

Sometimes I suggest a game to a particular software house, other times they approach me with an idea, and I work up a design for it. Hewson tend to like a good few explosions and that kind of thing, whereas Rainbird are of course quite different. You've got to tailor your ideas to a style that you know will be acceptable to the publishers.

More recently, I've been working in partnership with Chris Hinsley, of 'Pyjamarama' fame, and together we've been doing the complete game design. This is much more challenging, and of course more interesting. We come up with the basic game between us, then I produce some graphics and maps, Chris gets to work on programming it, and gradually we bat ideas back and forth and it all comes together. A game is never finished until the deadline gets you – with Verminator, for instance, the main characters and maps were finished long ago, but we're still adding things here and there. I'm always thinking of little touches to make games just that bit slicker.

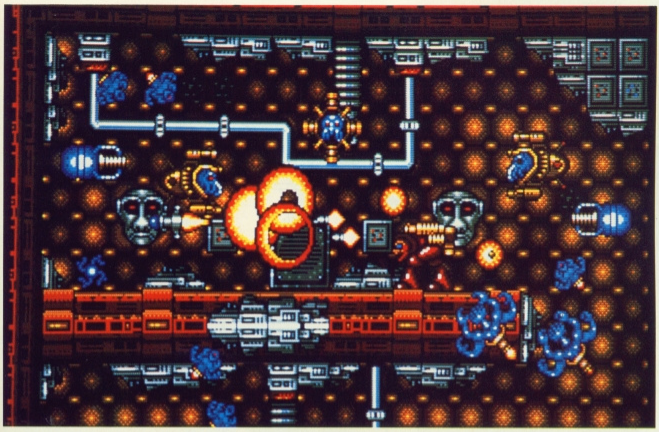
My work is all done on the Atari ST, since that seems to be the one the bulk of the games in the UK sell best on, and so the one most software houses are interested in first. Usually any ST game is converted for the Amiga within a month or two, but that doesn't really affect me. The graphics I've designed stay the same, the backgrounds and everything are just ported over and Chris gets to work on the reprogramming.

longer excusable on such machines. Unfortunately the new possibilities in terms of game structure of such graphics are often not fully explored at present for economic reasons: most software houses are not interested in 16-bit games that cannot be converted to the smaller 8-bit machines where the bulk of the profits still lie.

Pick a package

It is within these restrictions that the graphic artist must operate, and so it is vital that images which are technically simple look as visually striking as possible. In order to achieve this, graphic artists must have the most effective graphics software they can lay their hands on, as the standard of these packages not only dictates the speed of production but also the quality of the work. Having said that, it is equally important to use software you feel comfortable with. If you feel clumsy using a particular graphics package then the chances are your work will either be inferior, falling short of its full potential, or it will take you twice as long to produce it. Commercially speaking, this is useless.

The work I am involved with usually concerns animated sprites and the backgrounds they move over. Therefore I need an art package that is geared to achieving these things. I use Rainbird's *Advanced Art Studio*, which although lacking some of the qualities of *Film Director* is more than adequate for my particular requirements. Art Studio has a detailed yet comprehensive layout, and presents a far less daunting prospect for the artist than many art packages that look far more geared for word processing than graphics! There is also a useful help mode that is constantly displayed, supplying vital information at a glance. When the user gets more familiar with the package this can be switched off so that it doesn't interfere with work at high speed. Another thing that makes Art Studio so comprehensive is its superb use of icons. These icons, unlike some I could mention, are well drawn and true to their functions.



■ *A scene from Hewson's 'Guardian', another distinctively busy screen from Nigel Brownjohn.*

As well as being very comprehensive, Art Studio is also extremely good for sprite construction. When sprite frames have been drawn on a grid they can be transferred instantly to the waiting files for instant animation – just define the first and last frames of the sequence, click on the animation icon and your sprite will leap around the screen before you in its full glory.

My personal requirements centre around animation, as that is what first attracted me to computer graphics. Ideally what I need is a totally transparent affordable package capable of manipulating any sized object through a full 360°. Also if it could work out all the in-between frames of the animation, after I'd given it the relevant key frames, I'd be a very happy man as this would save me hundreds of hours' work.

Well done animation is a beautiful thing, but people are sometimes unaware of the infuriating task of co-ordinating all the hundreds of pixels that go into making up a piece of animation. The bigger the sprite, the more difficult this becomes as the various parts of the figure are not moved in a big chunk but dot by dot. There are various functions to assist this process such as 'copy', 'rotate' and 'flip', but they never do much to help on the whole.

Economy course

Creating backgrounds for games on the Art Studio is done using its invaluable 'map mode'. This can create vast maps comprising thousands of pre-drawn blocks and allows the graphic artist to develop his talents in this field to perfection. Building maps out of 16 by 16 pixel blocks is made far more difficult by the incessant need for economy in a program. An important part of the graphic artist's work is not only to produce excellent graphics but to do so using the minimum number of blocks, frames etc. When this is applied to map construction the graphic artist must make his 16 by 16 blocks as versatile as possible. A block designed to look like one object should, if possible, be used to look like several other objects on the map. This process is endless and can be mindboggling in its implications.

Art Studio allows me to draw and animate sprites of any reasonable size, it allows me to build huge game maps and animate them, as well as drawing screens etc. However, what I wouldn't give for a fusion of Art Studio and Film Director! Art Studio unfortunately only allows me to animate one sprite at a time which is crazy when I'm designing and drawing sprite games with up to 20 sprites zooming around and interacting on screen simultaneously! I never get the full picture until a programmer has coded all my graphics into the game, and by then, due to looming deadlines and other various factors, it's too late to change anything. What I find myself looking for these days is not so much a graphics editor as a pseudo games editor!

When doing graphics for an Atari ST game the first thing I usually tackle is the main character, as this dictates a lot of the flavour of a game. For this reason it is well worth putting a lot of thought into, as there's nothing more depressing than seeing yet another spaceship or run-of-the-mill spaceman with a laser gun crawl onto the screen at the start of a game. First impressions really count.

Originality and attention to detail are the keys to producing high quality graphics. This applies to all aspects of the game and its graphics. The graphic artist, apart from working out how big the map should be or how many frames to use in total on the sprites, should also work out exactly what he or she wishes to achieve as far as the 'look' of the game goes. It's all very well drawing lots of good looking sprites and maps, but if they don't all complement each other and look like part of the same thing then the game's flavour will suffer drastically as a result. *Verminator*, for example, was designed to look pleasantly weird, very colourful and non-cultural while maintaining a strong identity. The main character is very amusing and totally original. Whether the end result of all this thought and care is successful is not up to me, the designer, to say, but personally I'm very happy with it and I know a lot of other people are too.

3-D sprites next?

With the increase of three dimensional graphics in games software, many people are saying that the day of the computer sprite is drawing to an end. I don't consider this to be true; better graphics software and bigger machines mean improved sprites with proper support for rotations, light sources, shading and perspective.

If those people could see the images in my head or even had a chance to glance through my personal graphics files, I know for a fact they would soon change their views.

■ *Brownjohn works on an ST, and chooses Rainbird's 'Advanced Art Studio' as his workhorses. Mirrorsoft's 'Film Director' has a lot going for it too, and is sometimes a better bet.*

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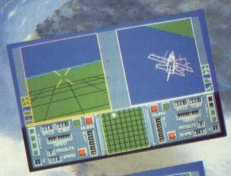

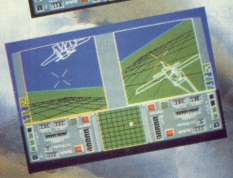

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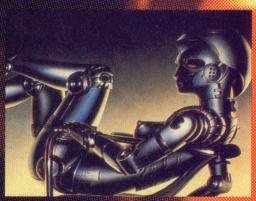
FUTURES

BY YOUR COMMAND

Portrayed as metal monsters carved in the image of man, the robot is nothing more than science fiction. Or is it?

- **FACT**: robots have existed since the 1950's.
- **FACT**: many have computational power greater than the human brain.
- **FACT** muscle is nothing compared to rippling metal.
- **FACT**: industry uses robots for manufacture, packing and painting; any science fiction film worth its salt features robots, some real, most spoof.
- **FACT**: personal robots introduced this decade are more numerous than versions of AmigaDOS and GEM combined.
- **FACT**: but nobody has produced a robot which has the intelligence of the human mind or the agility of the human body.

So where are they and who's using them? Will Marvin, the Terminator or No 5 ever 'come alive'? Richard Monteiro (R2M2 to his friends) investigates.



WEIZENING

Perhaps the most famous example of AI is Joseph Weizenbaum's Eliza program which provides semi-intelligent conversation with a computer. Weizenbaum has a great dislike of the subject (it seems too many people took Eliza seriously). His rationale being that AI's "very contemplation ought to give rise to feelings of disgust in every civilized person."

ROBOTS AND MEN

'Robot', being Czechoslovakian for slave labour, was first coined in 1917 by Karel Capek in his story, Opilec. 'Robotics' was also spawned from fiction – in this instance from Isaac Asimov's book Runaround published in 1942. Although the concept of the artificial man existed even in Greek legend, it wasn't until 1961 that the first factory robot was installed.

DAY OF THE ROBOT

Ever since Czech-born Karel Capek coined the word *robot*, the world has been treated to visions of laser-toting machines carved in, and often carving up, the image of man. It is this aspect of robotics, the idea that intelligent hunks of metal and silicon will reflect the human race's vices rather than its virtues, that has been built on by many science fiction authors. While it provides great entertainment, it is – for the moment – fiction.

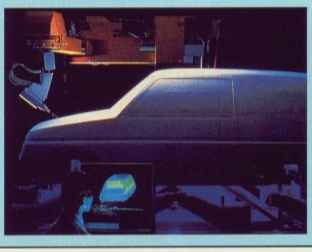
Before the advent of home or personal micros, computers were large and very expensive. Typically, an early computer would fill a warehouse and keep tens of operators in work. This is also true of early robots: huge industrial beasts taking up vast floor space and costing millions. The beginning of this decade, however, saw an explosion in the personal robot market; today there are hundreds of toy robots, computer-controlled robot kits and small-scale productive robots.

There is nothing mysterious about a robot; it has four main parts. Firstly, there is the outer structure and mechanical design. Secondly, there are motive power producers, which give the robot movement. These are called actuators. Thirdly the robot must recognise its position and know what it's working on – for this it uses sensors. Finally the whole caboodle must be controlled and co-ordinated – usually the role of the computer, although specialised circuitry is used in smaller robots.

ARTIFICIAL INTELLIGENCE

There are many robots that require sophisticated programs to allow them to learn from their experiences and make decisions based on those experiences. This type of pseudo-learning is known as Artificial Intelligence (AI). Together with IKBS, Intelligent Knowledge-Based Systems, AI programs are generally large databases containing known facts about a state or task or place, a set of rules for generating a required action when an event occurs and a strategy processor for changing old rules as experience demands.

The application of AI may result in robots being able to design a product for a particular application and then manufacture the item without any human intervention. Renault already have a robot that can carve a full-scale model of a vehicle out of polystyrene, from computer-based plans, in a matter of hours.



TELECHIRS AND EXOSKELETONS

■ ***The most common use for telechirs is to handle dangerous materials. The operator sits in safety behind protective glass while the mechanical arms imitate the operator's every movement. Other forms of telechir magnify or reduce the operator's movements.***

■ ***Ripley dons a Power Loader, a high-tech exoskeleton used for loading and unloading heavy equipment, before battling the gruesome Queen Alien.***

Remote control devices have often been used to extend the reach, power and hardiness of human limbs, but it wasn't until after the Second World War that this type of machinery advanced in leaps and bounds (sic). As scientists were required to manipulate radioactive substances in the atomic energy program, robot technology had to advance to provide the means.

Telechirs, being Greek for 'hands at a distance', are remote manipulators in constant use in nuclear plants, chemical factories, explosive plants and other sites where dangerous substances and devices have to be handled by humans from a distance.

Microscopic telechirs are used to extend rather than mimic the movements of a human hand: surgeons operating on the brain or knee, scientists dissecting microscopic samples and technicians testing microchip devices all use them to reduce normal scale movements to precise fractions of an inch. Other remote devices do the opposite by magnifying movement and amplifying force. Many cars, for instance, have servo-assisted brakes in which the force of the human foot is amplified by hydraulic or pneumatic power.

THE THREE DAY WEEK

After the Second World War, when companies were looking at ways of improving the efficiency of mass production (more merchandise, less rejects – that sort of thing), Ford in the USA showed the World the way by having the first factory robot installed. Today there are around 20,000 industrial robots in Japan, 10,000 in the USA and 2,000 in Britain. There appears to be no lack of demand for the industrial robot – they do the difficult, monotonous, dirty, dangerous jobs that we humans love to avoid.

So what effect will robots have on society? Already industrial robots are used for coal mining, servicing nuclear power stations, cleaning sewers and packing food. The pinch is already being felt in manufacturing plants which strive for greater output, and higher quality can only be achieved by automation. More and more redundancies with remaining staff working fewer hours. The more agile and intelligent robots become, the less there will be for us to do.

But on a brighter side, robots might eventually write magazines (*Some would say they already do – Ed*), do the shopping for us, cook our food, drive buses, provide our television and film entertainment, take over from surgeons. One school of thought suggests that, in the long term, this will indeed be the case. So, no more work for Jack; he certainly won't be dull.

No matter how important robots are to the World's industrial future, it is wrong to view them purely in terms of economics and productivity – for instance, their use in homes as a source of both entertainment and education is rapidly catching on.

What part will robots play in the future? The idea of a world dominated by mechanical men existed long before robots were ever invented and, in truth, such a scenario is no closer than it was 50 years ago. Attempting to predict the development of robotic technology is still the province of the SF writer.

However, if the robot is to become more useful, it must become more mobile – which means getting rid of wheel and track arrangements and replacing them with 'legs' (not two, but three or four for stability). The robot shell needs to become lighter; plastics and carbon fibre must be used in place of traditional steel structures. Similarly their method of sensing will have to become far more accurate. All this will give them greater freedom and flexibility. Then, and only then, will we see the emergence of the true thinking, moving machine.

■ ***Flexible Manufacturing Systems (FMS) are stealing the thunder from dedicated automation systems. FM robots load and unload components from machine tools like the lathe pictured above, and can then be reprogrammed to produce new products.***

THEORY

Perhaps it's time to reflect on Isaac Asimov's Three Laws of Robotics which he invented in his science fiction to safeguard us in a future, robot-infested, world:

1. A robot may not injure a human being or, through inaction, allow a human being to come to harm.
2. A robot must obey the orders given it by human beings, except where such orders would conflict with the First Law.
3. A robot must protect its own existence, as long as such protection does not conflict with the First or Second Law.

REALITY

The PROWLER, Programmable Robot Observer With Logical Enemy Response, is one of the delightful sentries employed by the army. The Logical Enemy Response in this case is two M60 machine guns. It is designed to patrol oil pipelines and perimeter fences. But what if it spots a passing armadillo? Well, that's bad news for the armadillo. However, the army are planning to incorporate verbal warnings and intruder identification.

AMIGAS IN INDUSTRY

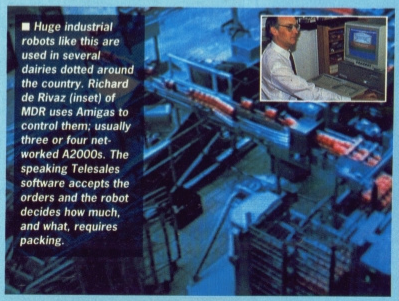
Danehill in Sussex is the unlikely location of MDR Interfaces, specialists in man/computer/machine interaction. After giving up his job as director of a dairy in 1982, Richard de Rivaz set up MDR. The move seems to have paid off as the company is involved in producing software and interfaces for controlling dairy-product packing robots; another project, Home Computer System, is near completion (details elsewhere in these pages).

Dairies located in Cricklewood, Exeter and Thornbury are already using the system which consists of large packing machinery (costing over £50,000), interface between computer and machinery, several networked Amigas (generally A2000s with in-built hard drives) and Telesales software. The total cost is still under £100,000 which, says de Rivaz, is very competitive.

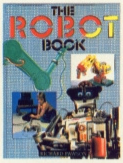
The interfaces and software are all de Rivaz's work, the network, Catenanet, is from Perihelion (who seem to end up in nearly every Future feature we write) and the packing machinery comes from a variety of sources. It depends on the dairy's requirements (part or full automation and variety of products) and the amount they are prepared to pay.

MDR's Telesales software – written in Amiga BASIC and compiled with the A/C compiler – allows the operator to key in sales, view the goods list, print customer details, display a transport summary and much more. The software speaks to you at every stage, and even repeats the orders entered to avoid mistakes, which appeals to the operators. As the system works under the Amiga's multi-tasking operating system, one operator can perform various tasks simultaneously on one machine; and several operators can share the same data as the whole system is networked. Usually three or four Amigas are networked – although there is no limit to the number that may be added.

The packing robot takes the sales data and decides which product needs packing and how much of each product is required; the whole process is automatic from selecting cartons, to filling, to heat sealing, to shrink-wrapping.



■ ***Huge industrial robots like this are used in several dairies dotted around the country. Richard de Rivaz (inset) of MDR uses Amigas to control them; usually three or four networked A2000s. The speaking Telesales software accepts the orders and the robot decides how much, and what, requires packing.***



THE ROBOT BOOK

For an informative read, packed with colour pictures of robots being used in almost every conceivable application, try the Robot Book by Richard Pawson, MD of PRL. Although a little out of date (published in 1985 by Windward), it is still very interesting. ISBN 0-7112-0414-4. Many thanks to Richard Pawson for giving us permission to use several of the pictures from his book in this article.

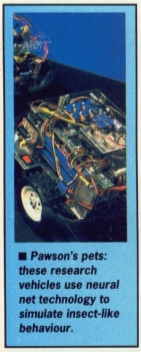
PERSONAL ROBOTS

One company that has put Henley on the map, for a reason other than its regatta, is Personal Robots Ltd (PRL). The company was formed in 1984 by Richard Pawson – former editor of Microcomputer Printout, Business Micro and Home Computer Course magazines – and specialises in the research and development of robotic technology. Rather than manufacture their own robots, PRL license them to other companies.

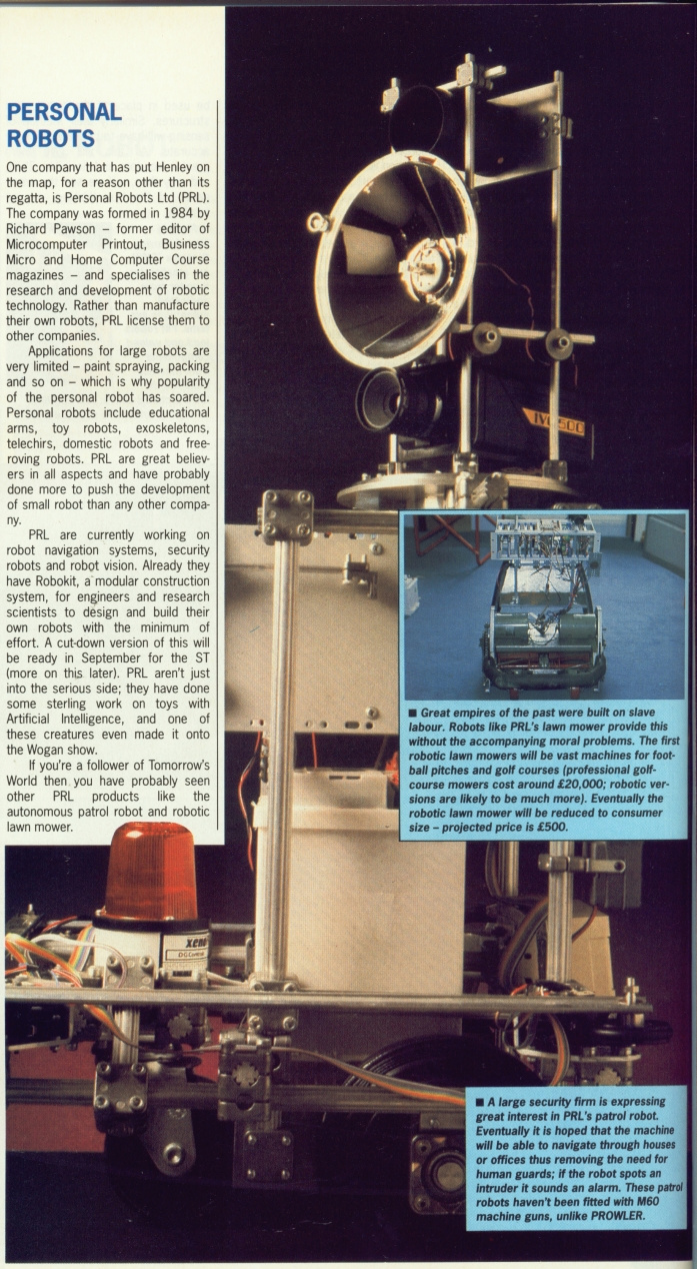
Applications for large robots are very limited – paint spraying, packing and so on – which is why popularity of the personal robot has soared. Personal robots include educational arms, toy robots, exoskeletons, telechirs, domestic robots and free-roving robots. PRL are great believers in all aspects and have probably done more to push the development of small robot than any other company.

PRL are currently working on robot navigation systems, security robots and robot vision. Already they have Robokit, a modular construction system, for engineers and research scientists to design and build their own robots with the minimum of effort. A cut-down version of this will be ready in September for the ST (more on this later). PRL aren't just into the serious side; they have done some sterling work on toys with Artificial Intelligence, and one of these creatures even made it onto the Wogan show.

If you're a follower of Tomorrow's World then you have probably seen other PRL products like the autonomous patrol robot and robotic lawn mower.

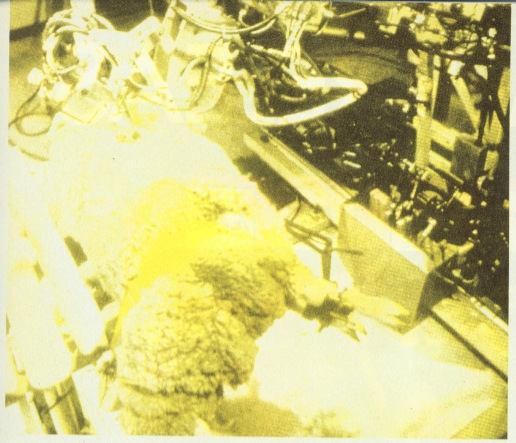


■ *Pawson's pets: these research vehicles use neural net technology to simulate insect-like behaviour.*



■ *Great empires of the past were built on slave labour. Robots like PRL's lawn mower provide this without the accompanying moral problems. The first robotic lawn mowers will be vast machines for football pitches and golf courses (professional golf-course mowers cost around £20,000; robotic versions are likely to be much more). Eventually the robotic lawn mower will be reduced to consumer size – projected price is £500.*

■ *A large security firm is expressing great interest in PRL's patrol robot. Eventually it is hoped that the machine will be able to navigate through houses or offices thus removing the need for human guards; if the robot spots an intruder it sounds an alarm. These patrol robots haven't been fitted with M60 machine guns, unlike PROWLER.*



■ *Only in Australia can you find such a robot. Designed as a non-stop sheep shearer, the robot – although slower than its skilled human counterpart (the robot taking around 15 minutes to complete the job) – has a control computer containing an image of a standard sheep in its memory. The robot's shearing head features touch sensors to detect variation in sheep size. Ewe never know where the next shave's coming from.*

ST AND AMIGA IN CONTROL

What better way to understand how a robot works than by controlling one from your micro? For £300 MDR (0825 790294) can supply you with the Amiga Home Control System. This comprises an interface (the same box that connects Amigas to multi-thousand pound packing robots) and software.

The software has been geared towards home security. It allows video cameras and other sensors to be connected to the interface and, if certain occurrences occur (like someone jemmying the front door) has the power to force the computer to phone the police or any other number of your choice, assuming you have a modem attached.

The possibilities are endless and not restricted to home security: eight input and eight output channels are available, modem and genlock sockets are provided and an optional mains modem can be fitted to the interface. The mains modem allows you to communicate to other devices via the mains; high frequency signals are sent along the mains cable. Typical uses include switching lights on and off, limiting the kids' TV viewing and controlling other household appliances.

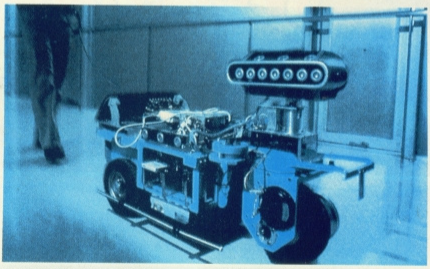
Datel Electronics (0782 744707) manufacture an interface and robot arm that can be controlled from an Amiga. Price for the arm is £39.99 while the interface and control software is £20.

PRL (0491 578001) are the only company to come up with a robot-control system for the ST. Robokit ST, which is a cut down version of their professional modular construction system, is made up of an interface and software. No firm price has been set, but it is likely to be around £75. The system is designed to control Lego robot arms and buggys (price for Lego kits starts at £50). Robokit is being aimed at the educational sector, although there is no reason why home users shouldn't benefit from it too.

The software (PROSE) – written in C – has been ported from GEM-based Compaqs and suitably modified. In its simplest form, Personal Robot Operating System and Environment allows the user to attach icons to graphic represenations of the robot and, by tagging commands to the icons (like move forward for three seconds), the robot can be manipulated in a manner that is both intuitive and fun. AI is one of the more advanced subjects that PROSE addresses.

Robokit is due for a September launch – look out for a full review of this remarkable setup in a future issue of Format.

■ *Richard Pawson, ably assisted by a hand, demonstrates Robokit ST.*



■ *It might live longer, but the Japanese guide robot will still dent your bank balance more than training 100 guide dogs for 10 years. The robot guide can carry loads, avoid obstacles and communicate with its owner via the leash.*

BUSHNELL IN BOTS

After his many ventures – including the formation of Atari (and creation of the fragrantly-titled Pong video game), the setting up of a pizza restaurant chain and his spell as a politician – Nolan Bushnell decided to turn his hand to robotics. Androbot was formed. Out of this company came Bob, a $2,500 robot that was designed to patrol houses and summon the police when its heat sensor sniffed an intruder. TOPO was another; this one was controlled from an Apple computer by means of an infra-red link.

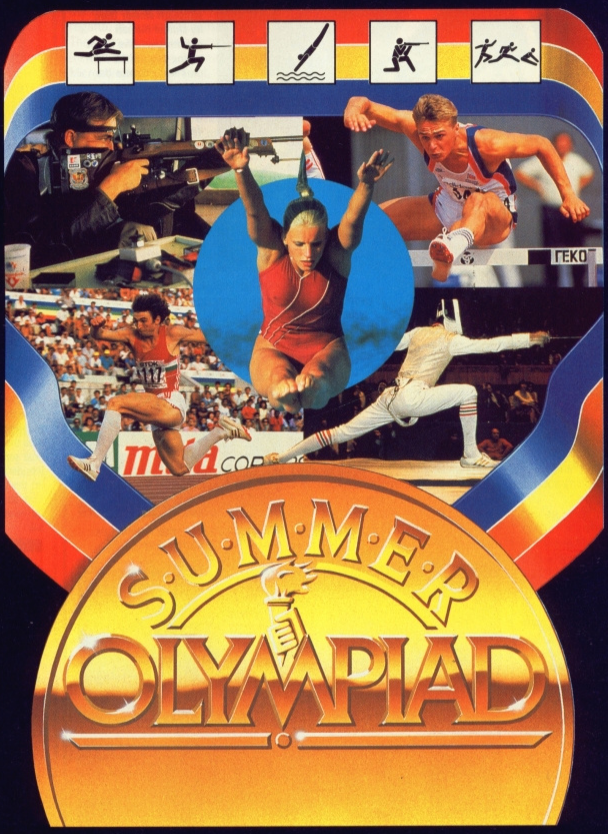
STS AT TVA IN USA

The Tennesse Valley Authority in Chattanooga, USA, provide electrical energy for millions of houses and companies in the surrounding area. Their exhibition centre – detailing how their numerous nuclear power stations work and the methods used to bring electrical power to so many houses – uses a massive pair of robot arms controlled from an ST to point to various objects in the exhibit.

Two engineers, John Hatmaker and Mark Monday, took over a year to design the robot and writing control software. The project was started from scratch as no manufacturer could offer a robot kit. Around 25 STs are used in the exhibit; the majority are hooked up to information-providing touch screen displays. The ST looking after the robot has a hard drive used for storing digitized cartoon voices for its use.

The men involved in the work decided on STs because, at the time, no one was selling comparable machines at such agreeable prices.

SUMMER RELEASE



The sequel to the hugely successful No. 1 from Tynesoft Winter Olympiad 88 – with five graphically stunning events and unbelievable playability.

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	Disk Price £9.95
BBC Electron	Cassette Price £9.95
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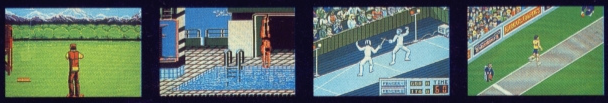

TYNESOFT
COMPUTER SOFTWARE

Addison Industrial Estate, Blaydon,
Tyne & Wear NE21 4TE
Tel: (091) 414 4611

SCREENPLAY

REVIEW

As the Autumn rush gets under way, our mailbag of goodies just gets bigger and bigger. Undaunted, intrepid reviewer Andy Storer pulls out the best.

In the past month, **FORMAT** received 27 full-price games for review. 10 of these were released exclusively for the ST, 8 for the Amiga. Add to this a further 10 budget 8-bit conversions marketed by Atari itself and you have more releases than most pockets can reach. So how do we choose the best ? Last issue we said we'd only review those games that showed **DEPTH, STYLE** and **IMPACT** and we're sticking to our word.

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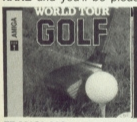
Format Gold

Think *WHIRLIGIG* and you think **LIGHTSOURCE 3D** – a lot of style, a lot of impact – we're talking **REALISM**; or at least an approach to it, given the fact that you're wandering around **4,296,967,295** mini-Universes looking for **PERFECT SOLIDS**. Since it took western artists at least **10,000 YEARS** to work out perspective it's good to know the boys from Maelstrom took only a couple to get **VARIABLE SHADING** up and running. Let's hope the coding catches on.

And so to *SPACE HARRIER*, our other **FORMAT GOLD** winner. Here we're talking **IMPACT** to the Nth degree in a surreal skirmish set in who-cares-where. Plenty of **STYLE** kicking around in there too – some of the **SASSIEST SPRITES** you're ever likely to catch a glimpse of. So it's an **EX-ARCADE FAST-BLAST** that got played to death while the pocket-money lasted, but have you seen the speed at which it shifts? Even now, its **TECHNO-GRAPHICS** are way out in front when you consider the coin-op would have used going on for 3 MBytes and 3 processors. Can't wait for the Amiga version.

And the rest...

MIRRORSOFT announced a new software label the other week and first off the launch pad was *SKY CHASE*; a combat sim flying in from the States. As a two player dueller it's **PRETTY DAMN RARE** and you'll be pleased to know its vector graphics are clear enough to be able to distinguish between an F-14 and an Airbus.

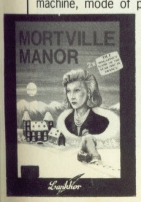


After one French software house beat all records for the **LONGEST LIQUID LUNCH EVER** the other weekend, we decided enough was not enough and went off to **LANKHOR'S** *CHATEAU MORTVILLE*. The way the French pack so much onto one disk is a mystery in itself – we know they love their language but to teach the sound chip to speak in **FRANGLAIS** is the kind of **FRENCH LESSON** we could all do with.

On the other hand, **BETTER DEAD THAN ALIEN** is a lesson in moderation. That's to say, how long can you go without booting it up and totalling every form of life you come across? While it may not be all that original, the **EXECUTION** is wonderful. **TAKE A BREAK** to join the search for life as we don't know it. And then blast it.

Which brings us to our final choice, *THE EMPIRE STRIKES BACK*. The aim here is quite straightforward – shoot everything in sight and wait for the sequel. **NEXT TIME GIVE US MORE LEVELS, LADS!**

Oh, and just before you turn the page, a final word on our reviews. Below the game's title we have a couple of boxes showing machine, mode of play and price. So, just to make it clear – the White box is the version of the game we've reviewed, okay ?.



Now turn over and get stuck into WHIRLIGIG – don't get yourself in a spin....

CLOSE... BUT NOT *THAT* CLOSE

So what of the games that didn't get reviewed? Here are a few honourable mentions: *OVERLANDER*, *FIRE AND FORGET* and *BUGGY BOY*, all released for both machines, are pretty similar in terms of gameplay and graphics – except in *BUGGY BOY* there's no BURN-UP ROADSTER VIOLENCE involved. All are great fun. For a while.

Huddled together under a sporting umbrella (*is it Summer again already? – Ed*) were *FOOTBALL MANAGER 2*, *PETER BEARDSLEY'S INTERNATIONAL FOOTBALL*, *WORLD GAMES*, *WORLD DARTS*, *EDDIE EDWARDS' SUPER SKI*, *SCRABBLE DE LUXE* and *CASINO ROULETTE*. You can find out all you want about these by reading their box covers.

Then there's the outstandingly unoutstanding ones. *EBONSTAR*'s box cover looked great, and *CHUBBY GRISTLE* had great fun taking the p out of the overweight – we couldn't see the joke. As for *GIGANOID*, well we're sure OCEAN will just love it. Why didn't SCA call it ARGANOID and remove *any* confusion.

REVIEW

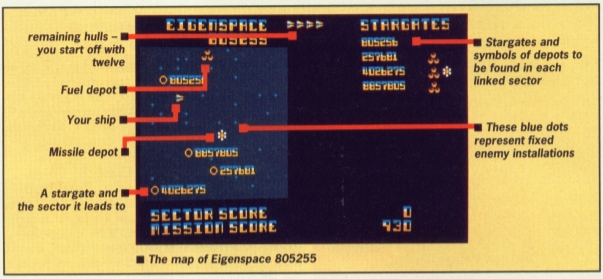
WHIRLIGIG

FORMAT GOLD

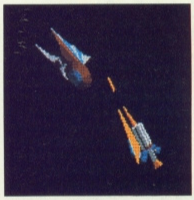
MAELSTROM/FIREBIRD

ST - £19.95, reviewed. Mouse, colour only | **Amiga - £19.95, due soon, mouse**

If you spent one minute visiting each of the 4.1 billion sectors of Telecomsoft's latest 3D epic you'd still be playing in 8172 years time! And if you reckon that's daunting, then imagine a game where you have no fewer than 100,000,000,000 enemy ships to blast away at in an attempt to reach the maximum possible mission score of 4,296,976,295. And even then you would have lost. The winning score is Infinity.

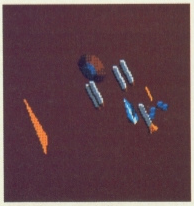


■ *The map of Eigenspace 805255*



■ *You fire a missile at an approaching Photon Class Cruiser*

■ *But you're to close*



■ *That's another hull gone*

GAMEPLAY

The 'Whirligig' is a vast network of spacetime sectors or 'eigenspaces', comprising stars, asteroids, depots and alien vessels, linked by numerous stargates. It forms a pattern based on prime factors and 'perfect numbers' – the aim is to traverse these sectors in a search for 'perfectspaces' where you have to locate and collect 5 perfect solids.

A perfect number, since you ask, is a number that is the sum of all its divisors excluding itself and, unbelievably, there are only five of them below 4 billion – 6, 28, 496, 8128 and 33550336. (6=1+2+3, and 1, 2 and 3 are the divisors of 6. Neat, huh?) These are the reference numbers of the perfect eigenspaces you're after. Don't panic if you bombed your last maths exam though – Whirligig doesn't demand any particular expertise, although there are shortcuts open to you if you can solve some hints the manual reveals.

You don't need to work your way through all those levels one by one. The underlying maths of the stargate network allows you to leap through millions at a time. You can arrive at sector 33550336 in less than 36 leaps. Whether you'll have visited the other perfect spaces in the process depends on whether you or your calculator enjoys figures.

Within each of the five perfectspaces you'll find a single floating 'perfect solid', starting at a tetrahedron, then cube, octahedron, icosahedron and dodecahedron which you must tow through a stargate to capture. Once you've collected all five, you've achieved the perfect score! Simple eh?

Almost. Along the way there's a whole host of alien vessels, some fixed, some cruisin' for a bruisin', that are out to make sure you'll have more to think about than maths exams. Your foes have obviously perfected their cloaking devices – although your pop-up control and radar panel will reveal the position of stargates, fuel and ammo dumps, you don't see any alien craft until they appear in front of you. Your adversaries have their own idea of perfection. And you don't figure in it.

Your arsenal consists of heat-seeking missiles and chaff pods mounted around your cockpit and hull; your progress through a sector is best treated with care – especially as your missiles like heat so much that if you miss your target ship they'll come running home with a big Hello. Chaff pods are often the best bet as they simultaneously deflect any incoming missiles whilst totalling any target in the vicinity with ease. But, as with fuel, you'll need to replenish your stocks regularly, and finding sectors that contain either or both can lead you away from your planned route.

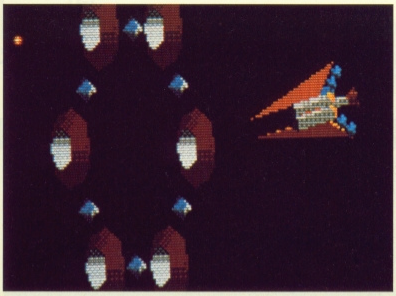
GRAPHICS AND SOUND

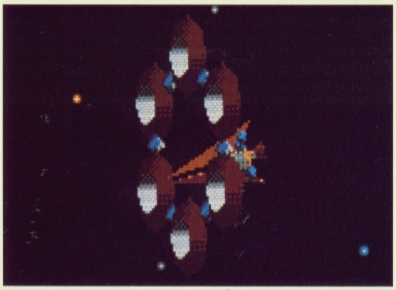
Shadows are no new departure for solid 3D – graphics programmers realised years ago that elevated objects look much better with a corresponding shaded area beneath them. In Firebird's other recent release, Virus, ground shadow plays an integral part in the gameplay – for close proximity combat it's essential to refer to the position of the shadow cast by an aerial opponent.

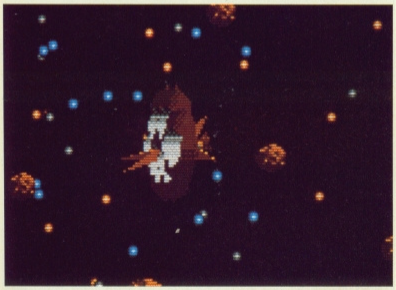
In Whirligig the shading comes from an off-screen external source (like a Sun) and is, in a sense, incidental since altitude and relative position have no meaning. Shadow is confined to the object itself; it has no function other than to illuminate and inject a realism to appearance. As such, this is an original achievement beautifully implemented and serves to elevate 'Lightsource 3D' as a feature which should form the basis of all future solid 3D releases. It's so convincing it's essential.

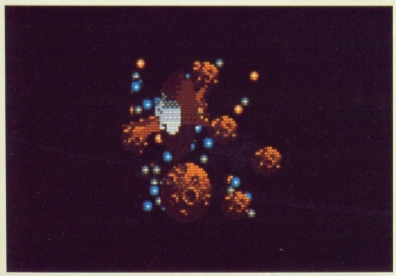
Pity then that the mouse handling is slack. Directing your ship is more than a question of individual sensitivity; control is loose.

Sound is also disappointing. The background music could be described as a slightly dubious rendition of a Pogues version of the Captain Pugwash theme playing at 78 rpm. What spot-effects are present merely warn of impending attack from the range of alien vessels.

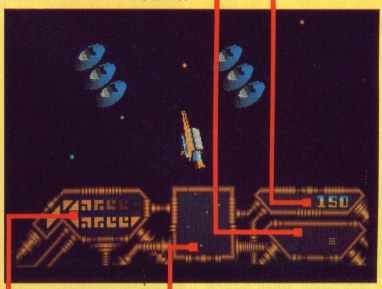








■ You head towards a Stargate and space implodes as you enter



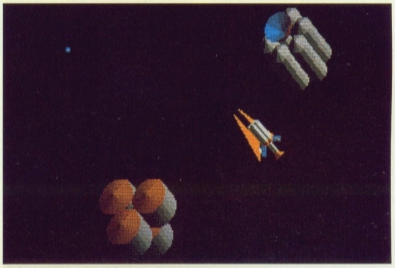
The depot screen showing availability of supplies ■

■ Your sector score

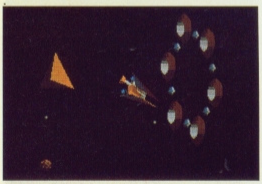
■ The fuel and missile gauges darken from left to right as the level drops

■ The radar displays strategic and navigational information – it won't plot the position of moving enemies though

■ Your pop-up control panel can be activated by pressing [ctrl].



■ You move close to a couple of depots to stock up on missiles and fuel



■ You've evaded all alien opponents and found your first Perfect Solid - a tetrahedron. You must tow it through the Stargate to make sure it's yours though. Only 4 more to go now, but you could be searching for quite a while . The final Perfect Solid is in Eigenspace 33550336

CONCLUSION

Despite a gameplay which insidiously begins to grip, 3D graphics which are out of this world and a background which is truly original, there's still an essential something missing from Whirligig. It has the depth, yes, but not the breadth to be a true classic. There simply aren't enough different things happening for it to be considered as anything more than a graphic exercise par excellence. But for the moment that's enough – Lightsource 3D games have made their debut with style.

still graphics
0 1 2 3 4 5

moving graphics
0 1 2 3 4 5

soundtrack
0 1 2 3 4 5

lasting interest
0 1 2 3 4 5

overall 84%

REVIEW

SPACE HARRIER

FORMAT GOLD

ELITE

ST – £19.99. Mouse or joystick | **Amiga – version imminent**

Two years ago the star of the PCW show was a Sega coin-op more accurately described as a climb-on. Queues for a ride on this low-slung jet bike with monitor for windscreen caused severe congestion and a number of punch-ups. When *Space Harrier* hit the streets a few months later the effect was the same. Arcade life shifted into overdrive. Now you can forget about all the other punters and jet around the galaxy from the comfort of your own chair.

■ *(1) These chaps are really losing their heads over nothing. Better give them a taste of their own medicine.*

■ *(2) Make room for the mushrooms....you fly above the agaric but what thanks do you get?. Make sure you don't hit that tree!.*

GAMEPLAY

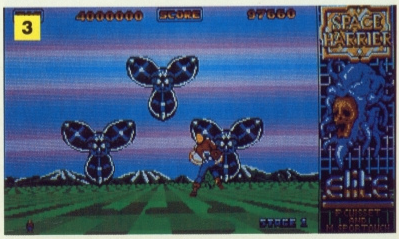
The aim of Space Harrier is to save the land from the dastardly perils of supernatural phenomena. This wouldn't normally tax the seasoned liberators among you, except for the fact that in this case your opponents are approaching the hypernatural and, despite being able to fly for long periods, you need to keep your feet firmly on the ground to cope with the rush of images hitting you. With the coin-op you got three lives before you had to delve into your pocket again – now you have three times as many chances to get used to the manoeuvres. They're not enough.

There are ten levels of feverish action as you try to dodge and destroy all manner of surreal flora and fauna. The speed of movement is electrifying – distant objects accelerate toward you at frightening pace as you run, leap or fly to a limitless horizon. Each level begins with a battle against a host of bizarre lifeforms – smiling stone statue heads, revolving black irises, floating fly-agarics and red-eyed martian war machines among them – some in spiral formation, coming at you from all directions, firing revolving neon ellipses. To make matters worse, the landscapes feature obstacles such as fields of stone columns, hovering boulders, mutant cypresses and day-glo pineapple bushes which you must weave and jump around like you've just had half a pint of liquid nitrogen poured down your trousers.

Levels conclude with prolonged combat against such unearthly adversaries as chameleon dragons breathing balls of fire, revolving statue spirals and giant Samurai robots going just nuts on you before the next non-stop frenzy is loaded. And what have you got to counter this heathen horde with? A mouse. That's what. In other words, go completely insane with the fire button and blast everything in sight.

Thankfully, mouse control is extremely responsive which is just as well since half the time you only seem to remain alive due to neural responses. Some levels require hand movements so fast you could scorch your desk top. As there's no auto repeat on the fire button your fore-finger takes a bit of a hammering too. As for your eyes... well it's probably best not to go out driving afterwards unless you have a Lamborghini and at least half an autobahn at your disposal.

To take a break from continuous firing you need only hit Space and you can continue play on a frame by frame basis – useful if you're unable to master a particular sequence. But beware; you can't actually go through an entire level on this slo-mo frame by frame advance. If you try, you are unceremoniously dumped back to level one. Hit Escape and you're returned to the rigours of realtime. Playing with the mouse is easier than with joystick, since response is much sharper – and you'd better believe it, reaction is what this action is all about.



■ *(3) Blooming hell!...A bunch of flowers get ready to spray you*

GRAPHICS AND SOUND

Stunning. Space Harrier was pretty hot in the arcades with its custom hardware drivers, but on the 16 bitters you'll still be surprised by the speed at which those huge sprites come hurtling at you. The transition from a small distant speck to a massive full-screen presence is like whipping a zoom lens to the max. They're almost too fast.

But it's not just a question of shifting around any old bunch of sprites at lightning speeds. The artwork is superbly detailed with great attention paid to the overall visual character of each level. Combined with the marvellous scrolling landscape, the game positively oozes style. It's as if all that arcade action has been squeezed into the small screen. The objects you're up against are depicted just as brightly and seem to move just as quickly as in the coin-op.

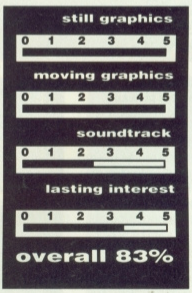
The sound doesn't quite match the graphics for style, and is confined to an everpresent backing track intercut with the regular cry of your character as he gets hit head-on once again. But it's visual action that counts in this one and Space Harrier is an object lesson in how to simultaneously shift large chunky sprites at impressive speeds.

■ *(4) Things begin to get a little tricky as robotic Samurai decide to get in on the act. It'll be all too easy to commit hari-kari with these guys around.*

CONCLUSION

By the time you've reached the fifth level and ridden the back of a dragon you'll be hooked on the spectacular action of Space Harrier. Because of its high quality graphics content you just can't write it off as arcade fare. It really is an excellent conversion and its screen velocities alone should ensure equally fast sales. Get Ready!

■ *(6) This chameleon two-headed dragon proves quite an adver-*



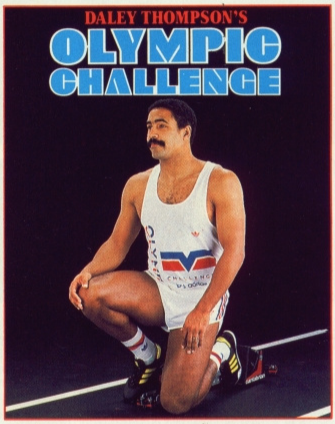
■ *(5) Fire breathing butterflies flutter by in high-speed attack formation. Just when you thought things were easing up some of their friends arrive.*

AMIGA
£24.95

FUEL FOR EN

Your plane has ditched on a mountainous plateau somewhere in deepest Tibet. You and your companions are alive. A large shape moves toward you, you rub your eyes in disbelief; a Dinosaur! – where are you ... and when? Stunning, monochromatic 3D graphics and 4 way scrolling, give that '50's cinema mood as you learn not only to survive, but also that your companions are not all they first seemed!

FROM ocean



Digitised graphics, referencing from full colour photographs of Daley Thompson himself, take full advantage of the Amiga's and the Atari's capabilities giving you a state-of-the-art sports simulation. Featuring an optional game play which allows you to 'work out' in the gym where your performance will directly affect your performance in the final events themselves – another first for Ocean!

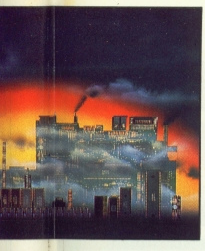
FROM ocean

Dinamic's attention to detail and superior graphi presentation add an extra dimension and Army Mo is no exception. A full-blown shoot-em-up takin you through several level where you will take command of first an armoured jeep, then helicopter and finally, on foot as you make your way through the jungle to the enemy's headquarter ultimately to seek out vita documents.

FROM

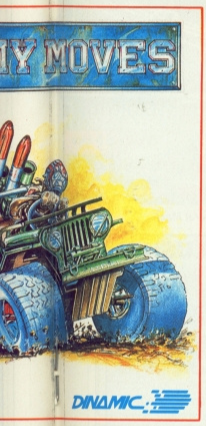
16 BIT STATE

6 Central Street · Manchester · M2 5NS · Telepho



ATARI ST £19.95

NTERTAINMENT



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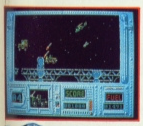
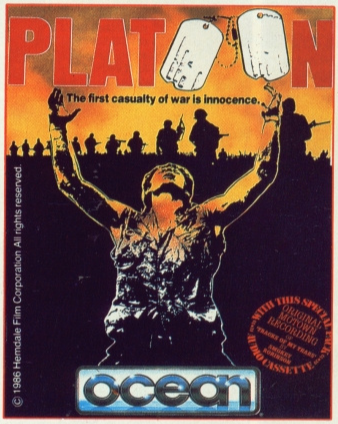
out vital

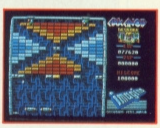



PLATOON
The first casualty of war is innocence.
© 1986 Hemdale Film Corporation All rights reserved.
WITH THIS SPECIAL ORIGINAL RECORDING
ocean

Exceptional graphics, innovative game design and digitised sound all add up to recreate the atmosphere generated in the box office smash hit. Closely following the original storyline you take your platoon, selecting individual men for assignment, who will encounter the enemy and their many booby traps as you seek to find the enemy's underground headquarters. On entering the warren of tunnels you will need flares and a keen eye – your enemy will lunge at you, from beneath the waters which flood the tunnel floor, wielding vicious knives – the atmosphere itself is enough to kill!

FROM ocean

One phrase sums up the success and appeal of Arkanoid – "I'll just have another go!" Arkanoid is addictive! Using all the capabilities of the 16 bit micro this conversion is almost an exact replica with all the excitement of the original Taito coin-op smash hit. This is Arkanoid – the blockbuster.



FROM

E OF THE ART

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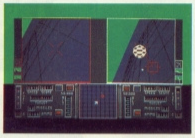
REVIEW

SKYCHASE

IMAGEWORKS

Amiga – £19.99, Joystick only | **Atari ST – version out soon**

The first release from Mirrorsoft's new label Imageworks is an air-to-air combat simulation imported from the States. Modelled on US Air Force and Navy flight school training competitions, *Sky Chase* offers would-be aces a choice of seven aircraft with which to engage in head-up confrontations against another player or the computer.



■ *You're about to get totalled by a robot paper plane's missile.*

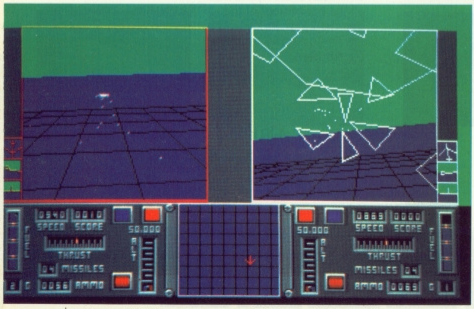
GAMEPLAY

Sky Chase provides simple, fast action, no nonsense dogfights – immediately. There's no need for lengthy expeditions across empty air space to find an opponent – at the beginning of each sortie he almost collides with you head on in a flyby sequence. From then on it's down to checking the radar whilst you grip that joystick and ride the Gs.

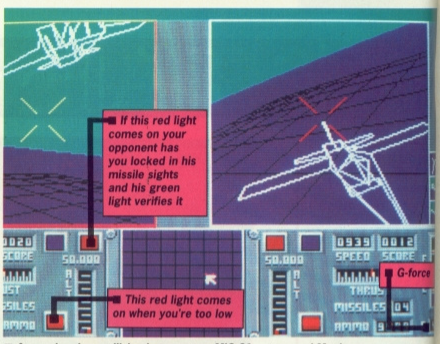
You can choose between piloting an F-14, F-15, F-16, F-18, MIG-27, MIG-31 and, for the kamikaze among you, a paper airplane. Origami can take on a whole new meaning as a paper fighter under computer control takes on your F-18 and spells out the real meaning of pulp as you hit the deck with around 2 tons of lead in your chassis.

Since there's no penalty for flying around (you have unlimited fuel, ammunition and air-to-air missiles), you may as well just go out there and have some fun. Once you have your opponent in view, a gunsight appears centre-screen and you can burst off some cannon. As you get nearer, a targetting box comes into view and you can double-click Fire to launch a missile. Once locked on, the missile finds it's way home with unerring devotion.

When you're on the receiving end, the only way you might escape such inevitable destruction is to perform some mega-G manoeuvre by hitting the shift key to whack up the thrust and twist so wildly that any real fighter would find its body-frame strewn across three continents. Needless to say, this kind of evasive action is best left to those experts for whom Top Gun and Firefox are lazy outings on a Sunday afternoon.



■ *You've just hit your opponent with a spray of cannon fire*


If this red light comes on your opponent has you locked in his missile sights and his green light verifies it
This red light comes on when you're too low
G-force
SPEED
SCORE
THRUST
MISSILES

■ *A near head-on collision between two MIG 31s at several Mach.*

GRAPHICS AND SOUND

There are no solid 3D graphics here to give you a realistic impression of flight but then that's not the real point of Sky Chase. What you have instead are smooth vector-graphics delivering fast screen updates of combat action. Speed, rather than realism, is being emphasised to compound thrills and spills.

The flat grid world over which you fly can be altered to display 49, 225, 961 or 3969 squares and, the wire-frame handling slows or quickens accordingly. With just a 49 square grid and a couple of F-16s, the action is very, very fast. However, because the world below is blank and featureless, and for most of the time you daren't look at the instrument panel for fear of missing a fatal shot, judging your altitude can be a touch sticky. At low altitudes, the only accurate measure of your height is whether you're still in one piece or not. Ground surface texturing would have improved this to some extent but probably only to the detriment of speed. Alternatively, audible warnings could have been used, but what FX are there are in no way functional.

CONCLUSION

Dual-screen aerial combat simulations are something of a rarity on any machine. On 16-bitters, Sky Chase is a first. If the graphic detail were more substantial we'd be dealing with something very special. As it is we're looking at an above average shoot-em-up employing smooth screen routines to convey the performance capabilities of a range of advanced fighters. Where Sky Chase really scores though is in its provision of one-to-one combat for two players. When you're up there with a friend as your foe you won't have time to analyse the graphics.

still graphics 0 1 2 3 4 5

moving graphics 0 1 2 3 4 5

soundtrack 0 1 2 3 4 5

lasting interest 0 1 2 3 4 5

overall 78%

ARKANOID – REVENGE OF DOH

PETER JOHNSON/IMAGINE

ST – £19.95. Mouse

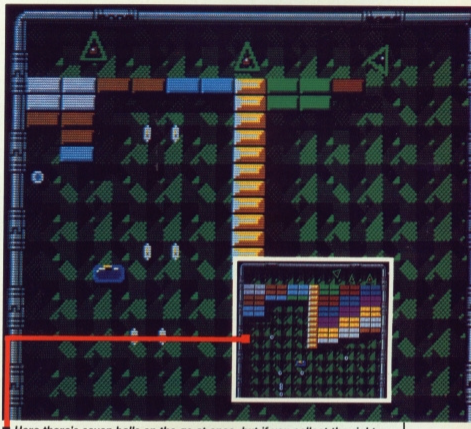
Amiga – £19.95, Mouse. Due this month.

The original 1986 Taito coin-op conversion convinced an awful lot of people that Breakout had really broken out for the final time. Yet Arkanoid's appearance on the 8-bits did more than spawn *Crack*, *Impact*, *Tonic Tiles* and, more recently, *Giganoid*. It paved the way for video and sonic overhauls on 16-bit reconversions that transformed Breakout beyond all recognition.

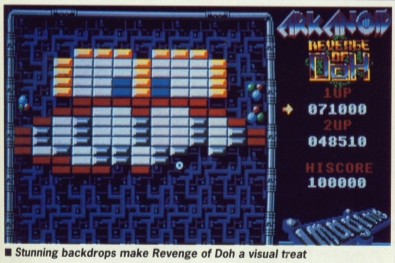
GAMEPLAY

In traditional style, you use your mouse to move a bat from left to right to deflect an energy bolt which will gradually break down the brick walls confronting you. Certain coloured bricks must be hit more than once and some are completely indestructible. Some are hit and disappear only to return again later, others begin to move from side to side. From the top of the screen emerge a host of animated obstacles which serve to act as random deflectors – swirling Saturns, moving molecules and bouncing balls among others – which are fortunately eliminated on contact with either the bat or ball.

You are aided in your attempts to clear the walls and proceed through the 64 levels by an assortment of capsules released upon destruction of the bricks they're hidden beneath. You must slide your bat to catch them and thereby benefit from their various properties. Each capsule is marked with an initial denoting its power. *Revenge of Doh* gets one over its illustrious predecessor in that there are now far more of these special features: if you're feeling really on form, you can have up to eight balls in play at once, have them break through bricks without bouncing off them, or split into three separate regenerating balls. In addition you can have twin and ghost bats in play. Including a special pod which bestows a random effect, there are now 13 featured capsules.



■ *Here there's seven balls on the go at once, but if you collect the right capsule... The effect is immediate*



■ *Stunning backdrops make Revenge of Doh a visual treat*

■ *These bouncing ball obstacles make this level almost impossible*

■ *Other capsules give you effects like multiple bats with echo.*

CONCLUSION

The extra effects in the gameplay transform what would otherwise be a straight breakout clone into a thoroughly compulsive classic. Every new game has screens of sufficiently random capsules to ensure a level of addictiveness that many games claim but fail to deliver. Revenge of Doh cuts code you'll come back to time and time again.

GRAPHICS AND SOUND

Super-solid backgrounds and dense block arrays place Revenge Of Doh very high in the graphics stakes. Animation of the various moving obstacles is super smooth but the ball itself suffers from a slight echo. However, up to eight balls can all move simultaneously with no apparent loss of speed, so this echo is a small price to pay for the vast amount of update information being processed when all hell breaks loose on screen. It doesn't detract from the overall appearance or the gameplay.

Spot sound effects only add atmosphere to a game of this visual quality, and serve to rescue you from complete and utter mesmerisation. The world outside ends when you tune in to this one.

still graphics 0 1 2 3 4 5

moving graphics 0 1 2 3 4 5

soundtrack 0 1 2 3 4 5

lasting interest 0 1 2 3 4 5

overall 80%

REVIEW

WORLD TOUR GOLF

ELECTRONIC ARTS

Amiga – £24.95, joystick or mouse | **Atari ST – no version planned**

The first golf simulator was a small tin tray seen to be lying around the carpets of executive offices. Later models got sophisticated – they shot the ball back to you. Which was all very well for your putting, but when it came to driving how could you possibly get into the swing of things?

Okay, so no golf simulator can really help you master your swings, strokes and putts, but it should give you a good idea of what club to use and when. World Tour Golf does this and more – better that you hook off the screen than into the real rough.

GAMEPLAY

After choosing a course from the 24 available, you can select up to 4 golfers to take part in a 18 hole tournament. The default characteristics of certain almost famous professionals – Jack Snicklaus, Curtis Weird, Futzy Cellar and Arnie Paltry – can be modified to alter drive distance, accuracy, tendency and recovery skill. Random factors affecting wind speed and the state of the greens are then introduced which ensure no course is ever the same twice. In fact you can expand the possibilities further with the course construction menu, allowing you to add, delete and copy holes from other courses.

On the left of the screen is a bird's eye view of the first hole complete with fairway, green, bunkers, trees and water along with a cursor indicating the default direction of the first drive. You can change this by simply clicking on an adjacent area of screen. Over on the right is a more detailed view of the immediate locality of the tee off, and also course, hole and club information.

Clicking once on the right window brings up the swing meter – the strength of your shot is determined by the amount of time you allow the swing bar to move. Clicking at the desired moment freezes the downswing and necessitates a further click to establish accuracy. Clicking too early means you will slice or fade the drive whereas if you're too late you'll hook or draw it. Once you've connected, you see the ball disappear into the distance on both screens.

■ *Designing a course*

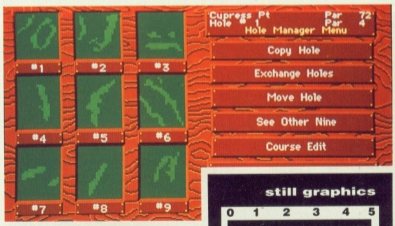
The swing meter is an ingenious means of emulating a stroke although it doesn't teach you how to do real thing! At least when a shot goes wrong you don't have to crawl on all fours in the rough looking for the darned ball. Putting is easier since you just press a numeric key to send the ball a corresponding distance.

GRAPHICS AND SOUND

You wouldn't really expect sound on a golf simulator would you? Apart from the thwack of the ball being hit the only other sound effects you'd be likely to hear in the real world would be of the four letter variety. That and the scampering of armadillos running for cover. It's no different here – the air around your monitor will turn blue too. Down on the screen, the predominant colour is, of course, green. The courses are beautifully drawn, with the variety of trees and bushes particularly well crafted. The animated movement of the golfer flows smoothly as he swings a stroke and if you make a bad shot a 'grimace bubble' appears. Some of the more exotic courses – with names like Goofy – have holes that could only feature in Disneyland.

■ *You're just about to drive*

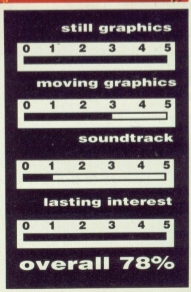
■ *The swing meter shows you're just about to hit that ball at full strength*



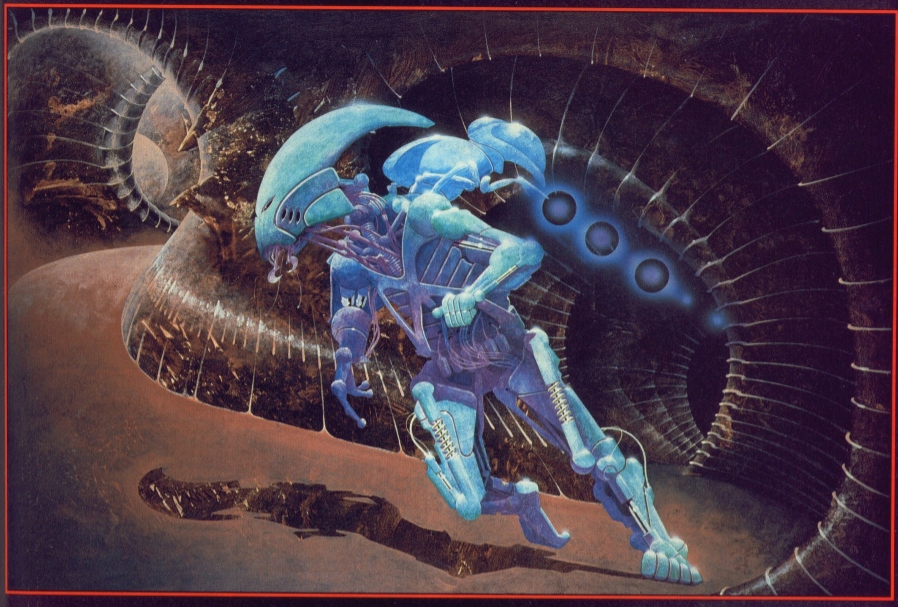
■ *Editing a course.*

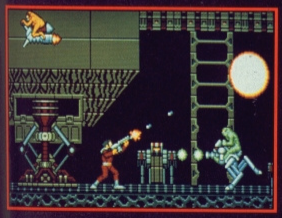
CONCLUSION

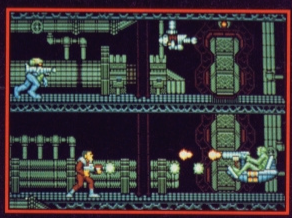
Definitely a game for those days when you've been washed out, which given summer conditions in the UK should be at least half the time, and a great way of practising your theory without leaving your armchair. All in all, there's no handicap here to having a very enjoyable game.



OBLITERATOR







OBLITERATOR

You are Drak the Last of the Obliterators, a genetically enhanced and awesome fighting machine, bio-engineered for the execution of incredible tasks, the ultimate solution to the most cataclysmic of predicaments.

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Summoned by the Federation council, your assignment is to use a prototype matter transporter to infiltrate the alien cruiser. Armed with a particle beam disrupter, lasers and whatever the alien habitat can provide, you must cripple the alien vessel thus enabling its destruction.

OBLITERATOR — £24.95

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REVIEW

MORTVILLE MANOR

KYILKHOR CREATION/LANKHOR

Amiga – £24.95. Mouse. Reviewed | **ST – £24.95. Mouse. Due August.**

France's-1987 Game of the Year and biggest seller apparently shifted twice as many units as its nearest rival, and now hopes to pick up a few accolades here too. If you've ever played and enjoyed *Borrowed Time*, *Deja Vu*, *Witness*, *Suspect* or any other whodunnit, then Mortville's for you.

GAMEPLAY

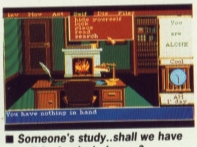
You play the part of Jerome Lange, a Bogart clone private eye who's received an invitation from an old friend to join her at Chateau Mortville to help with a desperate situation. With a name like Mortville you might suppose something is seriously wrong and, yes, you're right. Your old friend Julia has already departed. To Deadsville.

Arriving in a storm, you are met by the butler who gives you a run down on the place and its inhabitants before showing you to your bedroom. From there on it's entirely up to you. You may wander around the various rooms and the grounds outside, the idea being to search for evidence and find a variety of objects which may lead you to the murderer in your midst. There are eight characters on whom to pin Julia's murder: you may question these suspects directly about the background to the case and, as you progress and locate evidence, grill them about their alibis.

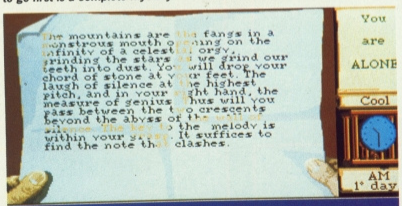
Discretion will make your task a lot easier. It's best to amass evidence secretly before confronting your presumed killer as, of course, everyone's guilty until proved innocent and it's quite easy to have a knife plunged in your back when all you're doing is exploring the attic.

So, who did dunnit? Like any good thriller, it's got to be the one person it couldn't possibly be.

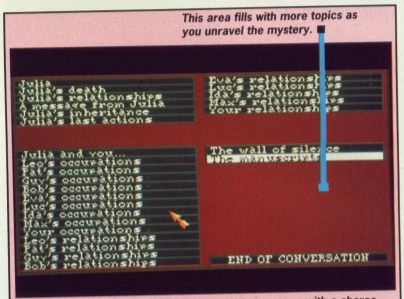
■ *You've just unpacked and where to go first is a complete mystery*



■ *Someone's study..shall we have a look in the desk drawer?*



■ *A parchment just happens to accidentally unroll in your hands*

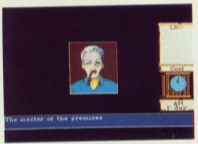


■ *This screen appears each time you want to converse with a character. You just click on the topic of your choice and are returned to an animated talking head for the reply*

GRAPHICS AND SOUND

Each location and object is depicted by simple but effective graphics, nothing an 8-bit micro couldn't put on screen. What makes Mortville really unique is that the characters really do speak to you, complete with animated faces as they deliver their message. Nothing new about speech in a game, you say, but eight characters talking clearly in thick French accents?!? Genius!' There's a staggering amount of speech crammed onto the disk, far too much for it to be digitised – the game is evidently using the Amiga's speech synthesizer chip directly, so how it'll work on the ST is anyone's guess.

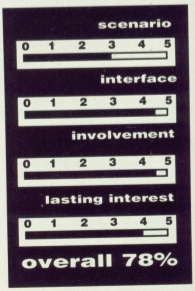
Add to this a wealth of high quality effects to supplement ambience – short musical inserts, doors swinging smoothly open, footsteps, chiming clocks – and you're talking Atmosphere; the big essential of any adventure.



■ *Leo pipes up to speak*

CONCLUSION

It'd be a sound decision to add Mortville to your adventure collection. Although the plot is a little clichéd, the method of interaction and sense of involvement are compelling enough to make up for this. And then again, it's great just to listen to all those crazy French accents. Just hope you end up as Poirot and not Clouseau.



INTERFACE

Mortville is a mouse driven adventure using a unique method of conversing with other characters. Discussions are selected by clicking on the name of the person you wish to talk to, and a screen then appears showing a range of discussion topics appropriate to what you've discovered at that point. You click on one to hear the reply, and you really do hear it, in an outrageous French accent!

Actions are determined from pull-down menus. Either a verb is understood and responded to immediately – you click on 'open' and a door does likewise, or the verb requires further qualification – you must move a cursor over the object to which you wish to apply your action and click to enact.

THE EMPIRE STRIKES BACK

VEKTOR GRAFIX/DOMARK

ST – £19.95. Mouse or joystick. Reviewed.

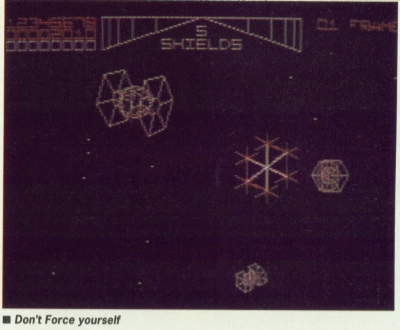
Amiga – £19.95. Mouse or joystick.

So how hard *does* it strike back? You'd expect unremitting carnage but in keeping with its prequel, *Star Wars*, the action is intense but relatively easy.

This time there are four levels of wire-frame frolics; you have to blast various probots before they can transmit pictures to the indescribably evil Vader (Boo! Hiss!), blast two types of Imperial Walker, blast tens of Tie fighters and blast and dodge an asteroid storm.

You have five shields for protection and a limitless supply of firepower to make up for The Force that doesn't seem to be anywhere around. There are three levels of difficulty – each requiring you to blast even greater numbers of Vader's minions.

The vector graphics have not been improved to any great extent. There isn't sufficient detail to make them anything more than passable. When the screen is full of small fighters the action is pretty fast but since screen update slows up considerably when you have more than a couple of the ponderous Walkers on screen, graphics routines may as well have been solid in the first place. They would have looked a lot better. And, yes, there's the odd burst of sampled sound from the film between levels. But difficulty and lasting interest there ain't.



■ *Don't Force yourself*

still graphics 3.0
moving graphics 4.0
soundtrack 3.0
lasting interest 2.0
overall 60%

BETTER DEAD THAN ALIEN

BDTA CREW/ELECTRA

Amiga – £19.99, Mouse, joystick or keys.

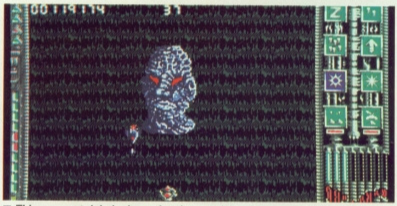
ST – £19.95, Mouse, joystick or keys.

Not exactly Advanced Computer Entertainment but great fun nevertheless. Better Dead Than Alien is a new wave invader clone if there ever was one, with some great variations on an original theme added with style and humour. Yep, some of those aliens really make you sick – literally – they're so damn ugly.

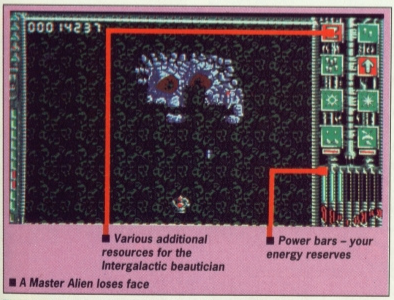
It features 25 levels of weird and wonderful lifeforms coming your way, firing missiles as they wonder why human diplomacy always takes the form of slaughter. Although they don't respect your speciesist humour they occasionally send you small power parcels to help you in your cause. Kamikazes to the last, their gifts take the form of extra lasers, neutron bombs, stuns, armour missiles, shields and, perhaps most helpful of all, auto repeat saturation blasts. With enemies like them, who needs friends?

Each level comprises a couple of waves of bizarre invaders leading to an encounter with a Master alien. Words cannot describe the fabulous mutants you'll confront, nor the difficulty of attempting to stay alive while you're dying laughing. Digitised applause greets your successes, and mocking laughter your abject failures, together with hordes of other weird sound effects.

Once completed, you can return to a level by entering a code word thereby allowing you to find out just how ugly the later Master aliens are without having to wipe the tears from your eyes. If wholesale slaughter is a favourite pastime of yours you'll find Better Dead a rewarding and satisfying experience guaranteeing hours of carnage in the name of beauty. A deeply philosophical encounter.

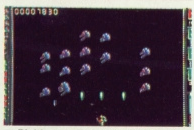


■ *This guy certainly looks under the weather – better give him a pick-me-up by putting him down*

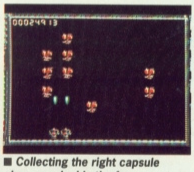


■ *A Master Alien loses face*

■ *New Wave Invader Clones meet Reptilian Mutant Filth*



■ *Picking up that capsule makes meaningful contact a little easier*

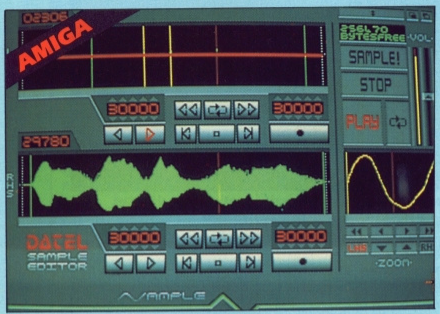


■ *Collecting the right capsule gives you double the fun*

■ *Beauty lies in the eyes of the beholder of an Auto Repeat Saturation Blaster*

still graphics 4.0
moving graphics 4.0
soundtrack 3.5
lasting interest 3.0
overall 75%

DATEL ELECTRONICS



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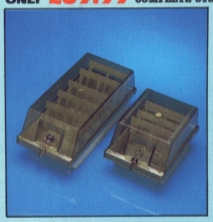

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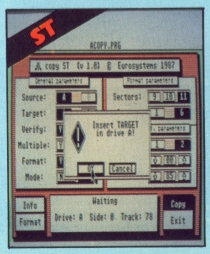

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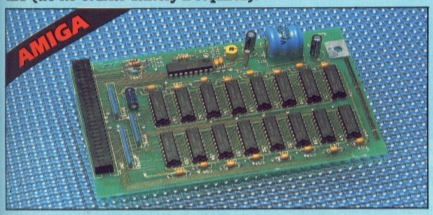

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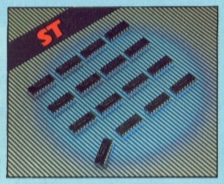

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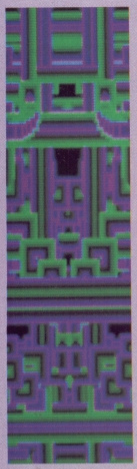


COLOUR SCOPE 3?

Trip-a-Tron has taken over a year to write and has superseded *Colourspace 2*, long promised but never seen in production. The idea of the new program came during collaboration over a light/sound video called MERAK. Its 28000 lines of assembler have been written from the ground up, and it's not intended as an extension of the earlier utility. If sales prove good, an Amiga version may follow.

GRAPHICS

THE ULTIMATE TRIP

A year in the making and now a product which firmly refuses to be categorised. *Trip-a-Tron*, from the keyboard of Jeff 'thanks to all the sheep and goats in a thirty mile radius' Minter, promises to establish the 'light synthesizer' as an essential tool. Simon Williams, a hippy at heart, gets thoroughly pixellated.

TRIP-A-TRON
All colour STs (Amiga version being considered)
£34.95, Llamasoft, 49 Mount Pleasant, Tadley, Hants (07356 4478)

The idea of sound synthesizers is now firmly established, and few self-respecting rock bands would be seen on stage without one. Their accompanying lightshows, however, are largely down to banks of high-powered spots, the occasional laser and someone at the back with a video mixer. There's no reason, though, why light shouldn't be moulded in much the same way as sound, via a computer keyboard or MIDI dummy keyboard. Using this concept as a design basis, Jeff Minter has created a light synthesizer for the ST.

This is no sound to light unit, and Minter is at pains to extol the virtues of a 'live' performance in which light riffs are put together with the same virtuosity as the bass line of *Comfortably Numb* (Pink Floyd's *The Wall*). So what has the Yak who gave us *Revenge of the Mutant Camels* provided in his latest package?

The effects

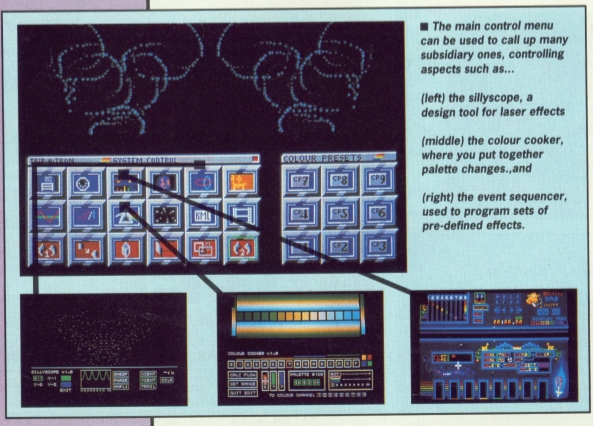
It's very difficult to describe the images you can create on screen with Trip-a-Tron. Some of the shots on these pages may help to convey the colour and variety, but they can do little to bring across the dynamics of the program. Because there's a decay built into each pixel's life and because the colour palette cycles through from light to dark and hue to hue, the image is forever changing. Just when you think you've spotted some form or shape, it metamorphoses into something else.

As with a sound synthesizer, which builds up its sounds from basics, such as the sine, square and triangle waveforms, so Minter's light synth starts with effects like the dot pattern, starfield (stars rushing past from a vanishing point in the centre of the screen), laser writing and geometric shapes. Onto these basic effects you can superimpose others, the most notable being palette switching. This can generate some spectacular and very fast-acting patterns

Laser effects are very cleverly executed, though their complexity slows down the running speed and is best left to comparatively simple shapes. Once you've designed a laser pattern using the aptly named 'sillyscope' (most things in Trip-a-Tron have apt, or at least silly, names) the program will happily manipulate it for you in the same way as you may have seen Guinness ads flipped around by fast moving laser beams.

Once you start playing the synth with the mouse, you realise just what potential the system has. Small lateral or circular movements translate into the most phenomenal patterns, slowly decaying into the next swirl or gyration. A quick flick of a couple of keys and the screen is full of flowing lines or shooting stars apparently moving across the screen as the colour palette is switched through the displayed shapes. What appears to be a single pixel moving with the mouse is transferred into a flourish of dots, lines and patterns when you hold down the mouse button.

All this is without a single sound registered. Trip-a-Tron is intended to be played by a dedicated performer, who would use it in a live show much as a sound synth player uses his keyboard. This doesn't mean that light shows are unrepeatable, though. A 'recorder' is included in the system so that tracks can be saved to disk and superimposed, one upon another.

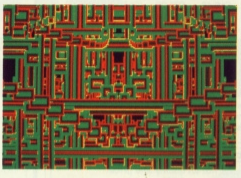


The main control menu can be used to call up many subsidiary ones, controlling aspects such as...

(left) the sillyscope, a design tool for laser effects

(middle) the colour cooker, where you put together palette changes, and

(right) the event sequencer, used to program sets of pre-defined effects.



■ *Forget the technology, this is the kind of image you can produce with the mouse*

From VSEQ to KML

Trip-a-Tron is packaged in a binder. Designed to appeal to anyone with a taste for personal organisers. The manual runs to some 140 well printed pages, bound together in tasteful burgundy complete with synthetic moleskin lining (which involved the death of no mole!). The program can be run on any ST, though extra features are available on machines with a megabyte or more.

Minter's main programming strength has always been in squeezing speed into the graphics of whichever machine he's working on. In Trip-a-Tron this isn't displayed as lightning fast sprites zapping everything in sight, but in the number of pixels he manages to manipulate in real time. Playing with the three demo files supplied with the program immediately reveals the variety of effects you can produce with the synth. The demos themselves are pre-sets for the various effects supported by Trip-a-Tron, and are worthy of several hours play just familiarising yourself with the concept and controls.

Macros and sequences

All the light effects can be executed in real time by calling up the appropriate menu and selecting parameters from it, but for live performance there may well not be time to go through this process. For this reason, and also because it makes the program far more versatile, Minter has included a Keyboard Macro Language (KML). As the name suggests, the language lets you assign small program segments (macros) to just about any key on the keyboard.

What the name doesn't suggest is that these program segments can control just about any facet of the program. As well as the standard loop and conditional structures of a high-level langauge like BASIC or Pascal, there are many specific commands for controlling the synthesizer directly. The demo programs are all short KML macros and it's instructive to read through these listings to see how they work. This is not to say that the manual has shortcomings, as the commands are well covered with many program snippets.

Coupled with KML is the sequencer, which allows up to eight light channels to be set going and controlled independently. This is effectively a simple multi-tasking system, and means that separate effects can be viewed on screen simultaneously.

So what?

Having sung Trip-a-Tron's praises as a unique and very well executed piece of software, you're still left wondering who's going to buy it. There must be a certain market for use by rock groups, in videos and perhaps in TV production. In these fields the program may perhaps suffer from the 'it's too cheap to be any good' syndrome, but home users would have to invest in a projection TV or a video wall to get the full effect from it – one 14" monitor at a local disco is hardly going to set the village alight.

There's no doubt Minter has an innovative product in Trip-a-Tron; it remains to be seen whether he can persuade the world it's really what they need. I'd buy one, if only to fill a few hours of relaxation, but then I've a predilection for armadillos, tapirs and most things wacky. Trip-a-Tron could be the start of something bright!

WITH HAND ON MOUSE

Control of Trip-a-Tron is almost entirely by mouse, though a graphics tablet is an alternative for the wealthy. Keyboard control is mainly restricted to entering KML programs and selecting specific effects from macros assigned to single keys. The mouse shows once again how good it is at translating subtle movements of the hand into precise effects on the screen, and the program is sensitive to the dynamics of movement, reacting differently to slow, small movements and large, sweeping ones.

The subsidiary menus (spattered liberally with sheep, llamas and yaks) cover disk access, MIDI set up, the sequencer, the sillyscope, waveform generator, pattern creator, colour cooker, starfield edit, KML, keyboard assignments and video sequencer. These all sound pretty obscure, but are well explained in the manual, and soon seem to slot into place in the overall system.

When actually 'tripping', the colour palette can be controlled from the numeric pad and the degrees of pattern symmetry from the cursor cluster. Other special effects can be assigned to keys on the main keyboard from one of the menus. The overall technique is both reasonably easy to remember and very versatile. Quite commendable in such a complex system.

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- **Comprehensive macro language for pre-setting effects**

against

- **Large screen needed for full benefit in performance**

features
0 1 2 3 4 5

performance
0 1 2 3 4 5

ease of use
0 1 2 3 4 5

manuals
0 1 2 3 4 5

format value
0 1 2 3 4 5

ANIMAL CRACKERS

A man who likes sheep and llamas is always assured a welcome in Format. Minter is perhaps one of the few programmers to have seen tapirs in the wild and the number of references to fauna within Trip-a-Tron exceeds even the small contribution in our own pages.

MINTER BIT STRONGER

Jeff Minter first became known in the heyday of Commodore 64 and Spectrum games for his somewhat askew view of games and for writing some of the fastest zap 'em up code yet seen. Since then, he and Llamasoft have been comparatively quiet. Jeff surfaces into the computer press every so often with tales of trips to Machu Picchu or of an ergonomic bicycle, the precursor to Sir Clive's C5 (but rather more long-lived).

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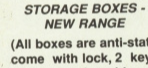

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DISK EXTRA

ST Amiga Format's unique dual format disk gives you the best of both ST and Amiga worlds!

ST

64 POWERDROME

Electronic Arts' brand new jet-racer game must be the one to end all racing sims. Check it out with our stunning megademo.

65 CHESSNUT

One for the more serious gamester, this. With some excellent 3-D graphics of the chess

board, ChessNut isn't just a pretty face – it plays a mean game too.

65 SPRITE EDITOR

Sprite Editor is a program designed specifically for those of you who program in GFA Basic. Designing sprites has never been so easy.

66 DC CLOCK

DC Clock is another one of those incredibly useful programs that make you wonder how you managed without it. Keep track of time without ever having to take your eyes off the screen again!

66 CHEATS!!!

Stuck on *Star Wars* or *Xenon*? Beat the games with this month's cheats. Who ever said dishonesty gets you nowhere?

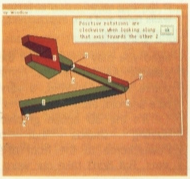
AMIGA

64 KIND WORDS

Everyone needs a word processor – try out this exciting new WP in the comfort of your own Amiga, and see why everyone's talking about it.

66 3D ARM

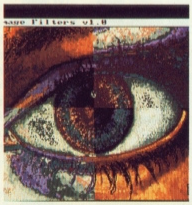
You've read the article on robotics in this issue (you have,



haven't you?) – with this fascinating program you can flex your own robotic muscles on your Amiga's screen.

66 FPIC

Doctor your low-res picture files and forget the vet's fees. Fpic allows you to enhance your Amiga art using the excellent Image processing tools offered within the depths of it's menus.



68 DROPSHADOW

2-D displays are all very nice but with this program your Amiga' can master the third dimension. 'Dropshadow' automatically adds very convincing shadows to all Workbench windows.

68 CHEATS!!!

Now Amiga owners can be as dishonest as their ST brethren with patch programs for *StarGlider*, *Amiga Karate* and *Space Ranger*. Refreshes the levels other players can't reach!

WE'RE PAYING £800! FOR GOOD SOFTWARE ON OUR COVER DISK

We're looking for good quality software to fill our cover disk each month. If you're a nifty programmer you could earn big bucks from your labours – games, business applications, utilities, or anything of general interest. We're also interested in any especially original graphics you may have created with art packages, either for inclusion on the disk or printing in the magazine.

Turn to the end of this section for more details on how to get your software onto the Format cover disk.

POWERDROME DEMO

Colour STs only

FILE NAME: POWERDMO.PRG

Suddenly you're in the hot seat of a jet-racer at the Powerdrome XXIV championships, up against four top pilots from other galaxies. Your mission, should you choose to accept it, is to scream around the course faster than any other being, and capture the coveted Cyberneufe Trophy.

Powerdrome is the hottest new game for the ST from Electronic Arts, and their first product written solely in the UK (do we hear strains of 'Rule Brittania' in the background?). It's due for release in late September, with an Amiga version in November. The final program will have a unique two-player option allowing you to hook up two machines together and blast a 'friend' from the skies. In the full game, you've got a season of six races to negotiate on different planets around the galaxy. The pre-race tuning is the key to success: a tuning-up screen allows you to tweak the airbrakes, aerofoils, fuel choice and engine to perfection.

You can pop in to the Robopits for repairs – the pits are fully automatic, but if you're too badly damaged you may have to call the intergalactic AA for a tow home (Oo, you're a nice android, a very, very nice android, etc.)

It's the 3D action graphics and sizzling sounds that powers Powerdrome to the front of racing sims. But don't take our word for it, sit back and let the action speak for itself. To spare your nerves unnecessary fraying, the demo doesn't ask you to do anything – it shows off its marvels while you sit and gape.

Electronic Arts tell us that the music on the final game will be vastly improved over this demo version.

■ *Michael Powell, author of Powerdrome.*

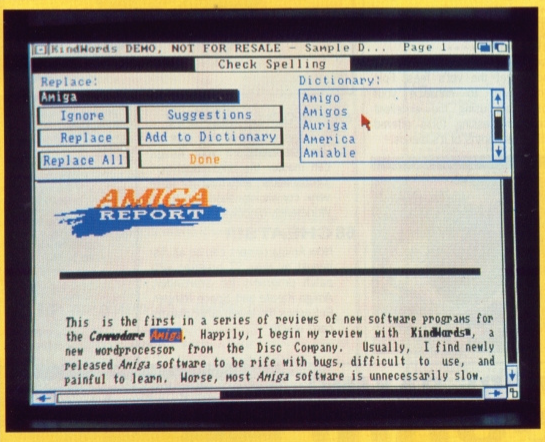
■ *Hurtling round a corner faster than you ought to in Powerdrome... the 3D walls twist and turn impressively fast – blink and you could be a case for the scrape squad.*

KIND WORDS DEMO

All Amigas

ICON NAMES: KINDWORDS, KINDWORDS.DOC

This is a demo of the excellent *Kind Words* word processor from the Disc Company/HB Marketing.


KindWords DEMO, NOT FOR RESALE – Sample D... Page 1
Check Spelling
Replace:
Amiga
Ignore
Suggestions
Replace
Add to Dictionary
Replace All
Done
Dictionary:
Amigo
Amigos
Auriga
America
Amiable
AMIGA REPORT
This is the first in a series of reviews of new software programs for the Commodore Amiga. Happily, I begin my review with KindWords, a new wordprocessor from the Disc Company. Usually, I find newly released Amiga software to be rife with bugs, difficult to use, and painful to learn. Worse, most Amiga software is unnecessarily slow.

Kind Words includes everything you'd expect to see in an Amiga word processor, and many extras. The full version of Kind Words incorporates a 90,000 word spell checker and mail merge facilities as well as the ability to import pictures into your documents.

If you've ever used an Amiga word processor that allows you to include graphics with your text, you'll know that although it looks lovely on screen, once printed out the results can look decidedly grotty. To overcome this, Kind Words uses high resolution 'Super Fonts' that have four times as many dots per character as the standard Amiga system fonts. Another powerful feature of Kind Words is graphics manipulation – once you've loaded a picture into your document, it can be stretched or cropped to size.

The version on this month's cover disk is complete except for mail merge and spell checking. It also doesn't support saving or printing documents. If they left these features in, there'd be no reason to buy the full version, would there! What you *can* do is load text or IFF graphics and manipulate them within the program. You'll soon see what a joy Kind Words is to use. You'll also notice that some of the fonts are missing – a function of available space on this month's disk!

As Kind Words uses disk based fonts, our demo will only load when the disk is inserted at the 'Insert Workbench' screen. If you've already got Workbench or another program running on your Amiga, press [Ctrl][Amiga][Amiga] and insert the Cover Disk into your Amiga's internal drive. The Kind Words demo then loads automatically. As a final note, during the loading of KindWords the screen will act very strangely indeed; don't worry about this as it's only our very clever de-compacting program doing its stuff.

■ Contact HB Marketing at Brooklyn House, 22 The Green, West Drayton, Middx, if you want to purchase the full version, at a mere £49.95.

ST

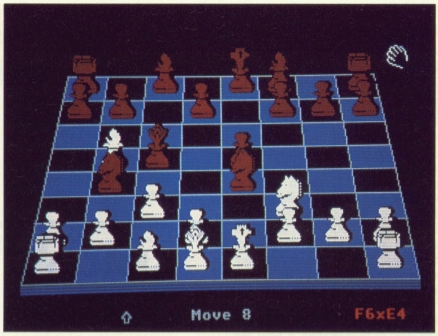
First, copy and load the disk as described at the end of the Disk Extra section.

CHESSNUT

by G. Franklin
Colour STs
FILENAMES: CHESSNUT.PRG, CHESSNUT.DOC

Last issue's cover disk contained Megaroids for those of you who enjoy a good blast. This issue it's time to bring a bit of non-violent gaming to the cover disk in the form of the excellent 3D chess program, ChessNut.

ChessNut can be run by either double-clicking on the ChessNut icon on the Desktop or by selecting the ChessNut option from the menu program, CLICK_ME. A detailed documentation file called CHESSNUT.DOC is also included on the disk. You need to read this before you can play the game properly.



■ *ChessNut setting out to play a mean game*

The most impressive thing about ChessNut is the excellent 3D graphics – definitely on a par with commercially available chess programs such as *ChessMaster 2000* from Electronic Arts. If 3D doesn't appeal to you, you can easily switch to a 2 dimensional view with the click of a mouse button.

The first thing you do to play ChessNut is to select which colour you want to play by pressing either B or W. You then select a computer or human opponent from the Game menu. All moves are entered as algebraic expressions such as E1-E3 – this particular move would take a piece from position E1 two squares forward to E3.

SPRITE EDITOR

by Stephen Kendrick
All STs
FILENAMES: DESIGNER.PRG, DESIGNER.DOC

Calling all GFA Basic programmers! As many of you will know, designing and incorporating multi-coloured sprites into GFA Basic can be a rather long-winded process to say the least. Well at last help is at hand in the form of Stephen Kendrick's incredibly useful GFA Sprite Designer.

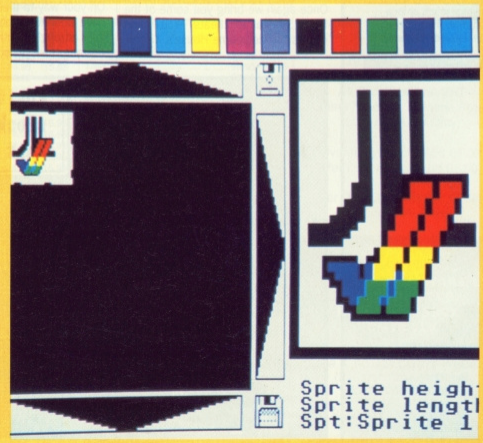
Until now there have been several ways of designing and using sprites, though all require a fair amount of luck and perseverance. You could either load a picture file into your program, cut out the area of the screen you wish to use as a sprite and save it to disk. Alternatively, you could use GFA's own sprite editor, but that only runs in high resolution. Multi-colour sprites are still a problem.

Loading and running the sprite designer is simplicity in itself. The first and easiest method is to click on the CLICK_ME menu program from the cover disk. Alternatively, you can double-click directly on the DESIGNER.PRG icon.

Also on the disk is a file called DESIGNER.DOC, which is the author's own instruction manual for the program. Although the program is pretty self-explanatory, this file is recommended reading for any who wish to use the program to its full.

As with many programs, the best way of learning Designer is to play around with it, but here's a quick run down of what it has to offer. When you first load the designer program you notice 16 boxes representing the current colour palette. Obviously in medium or high resolution modes only some of these will show colours. Below the colour palette are two boxes, the left-hand one showing the entire work area of 128 by 128 pixels, with the right-hand one giving a magnified view of a small section of the work area. All pixel editing is done within this box and your sprite is automatically drawn to actual size in the left hand box.

Branching off from this main screen are several minor screens that allow you to do such wonderous things as defining a custom colour palette with the full 512 colours in the ST's repertoire. Another screen lets you set a mask for a sprite (a mask is like a transparent border which stops the sprite from interfering with the background screen, or vice versa).



COMPUTER GAMES

If you though Space Invaders was the oldest computer game, think again. The basic methods for playing chess by computer were described by Claude Shannon in 1949, and the first programs ran on IBM mainframes in the 1950s. In 1977, a computer programmed by Northwestern University in Canada became the first to beat a Grandmaster in a competition. Even so, top players still reckon computers are incapable of matching the Kasparovs and Karpovs of the world. Give it 20 years, and we'll see...

DISK

DC CLOCK

Public Domain
All STs
FILENAMES: DCCLOCK.PRG, DCCLOCK.DOC

Remember the fast formatter we included on cover disk 1? DC CLOCK is another gem (!) from the same authors and once again proves invaluable. Have you ever been working away on your ST only to find that what seemed to be ten minutes keyboard tapping was, in fact, much longer? DC CLOCK puts a digital clock in the top right-hand corner of the screen so needn't even take your eyes off your monitor to be able to keep track of the time.

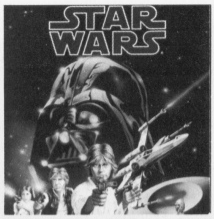
Install DC CLOCK either by clicking on its program icon from the Desktop or by selecting it from the CLICK.ME menu. When it has finished loading it prompts you to enter the current date and time. Do this and click on OK. As if by magic (and clever programming), a clock appears on the screen happily ticking away. The clever thing about DC CLOCK is that it is independent of the screen, so it always appears in front of anything else on it. Since it works using interrupts, however, some programs may slow it down or even stop it all together.

If for any reason you'd rather not be reminded of the steady advance of time, run DC CLOCK a second time to remove it.

CHEATS

by D. Sanger
All Colour STs
FOLDER: POKES

Once again we bring you some of the best ST game cheats. You'll find cheats for Melbourne House's *Xenon* and Domark's arcade conversion *Star Wars*. If you're fed up with getting blown up, shot or eaten, simply follow the instructions in the documentation files (each documentation file has the same name as the poke, but a .DOC filetype) to load and execute these excellent games cheats. Make sure you also read our tactfully phrased disclaimer and never use the original copy of a game to try a poke out on. See 'Gamebusters' on pages 74/75 for more details.



NEXT MONTH!

Attention all players of Mirrorsoft's 'Dungeon Master'. On next month's disk will be a stunning program from reader Edward Penman to completely customise your own dungeon. You can write a new map and change any of the characters or locations – in short, it gives you a whole new game!

AMIGA

First, copy and load the disk as described at the end of the Disk Extra section. These programs run on both the Amiga 500 and the 2000. We have been unable to test them on the early versions of the Amiga 1000.

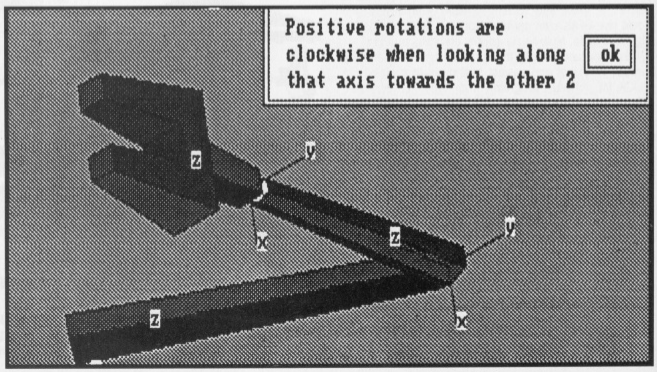
3D ARM

Public Domain
All Amigas
ICON NAMES: ARM, ARM.DOC

On your way to these pages, you may have noticed a robotic theme featuring strongly within this month's *Format*. Like it or not, the use of robots in all areas of life is becoming increasingly common. We thought you might like to experiment with the theory behind robotic control and have included 3D Arm to help you do just that.

In the words of its authors, 3D ARM was designed to study 'goal-directed animation of articulated objects'. For those of you who didn't understand a word of that, articulated objects are those that have got joints like wrists and elbows, but are constrained by attachment to other objects (like the hand, forearm and upper arm of a robot, for instance). If that last sentance sounded tricky too, it's because it was again stolen from the author's documentation!

You can load 3D ARM by double-clicking on its Workbench icon or by selecting it from the CLICK.ME menu program. Also included with the program is a short documentation file describing fully all the functions of the program. Once loaded, a wire frame 3D view of a robot arm is displayed. The arm itself is split into three parts with fully articulated joints at the wrist, elbow and shoulder. All three joints can be assigned movements independently or, for more realistic action, can be made to move at once.



■ *Not quite R2D2, but nevertheless a real robot arm on your Amiga, courtesy of the 3D ARM program.*

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FPIC
Public Domain
All Amigas
ICON NAMES: FPIC, FPIC.DOC

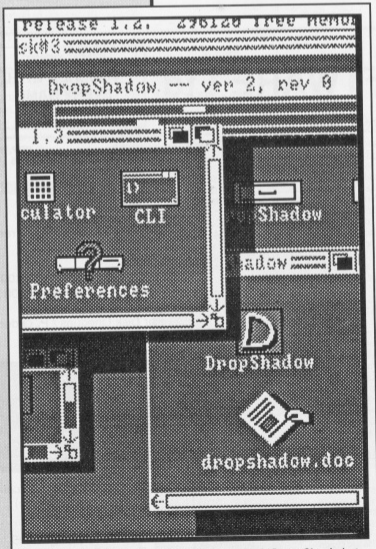
■ *FPIC can enhance your Amiga picture files – here's a sample for you to eye up.*

With the arrival of machines such as the ST and Amiga, graphics techniques that were once the domain of dedicated graphics workstations are now within the grasp of the home user. 'Digital Image Processing' is one graphic technique now available to Amiga owners. There is no denying that the Amiga is starting to make an impact in the video industry and with this success have followed several professional quality image processing packages. Packages such as Butcher and PIXmate are excellent examples of the high quality of Amiga programs of this genre. Not to be left out, Format presents FPIC, a public domain image processing package.

You can load FPIC either from our CLICK_ME menu or by directly clicking on the FPIC icon. Sitting next to the FPIC icon, is FPIC.DOC, a file containing the author's documentation. Read this first for full instructions.

Once loaded, FPIC displays a blank screen. The first thing you should do is to load a picture – any low resolution Amiga picture file should do (such as last month's Gorilla picture). All popular Amiga art packages support this 'IFF' format (DPaint, Aegis Images etc). If you aren't the owner of an Amiga art package, the 'Fish' public domain disks are a good source of IFF artwork from some of the Amiga's top graphic artists.

All functions within FPIC are accessed from the pull down menus. It's worth experimenting with all the different processing tools to get an idea of what's on offer. A word of warning though; as FPIC was designed primarily for use on mono images, some of the tools can cause drastic results if you're not careful. If you do completely botch up your work of art, all is not lost as you can restore your picture to its former glory by selecting Restore Image from the Project menu.

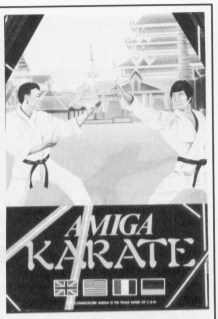


■ *Dropshadow adds shadows to Workbench windows. Simple but effective, eh?*

CHEATS
by A. Grifo
All Amigas
ICON NAMES: PATCH_#1, PATCH_#1.DOC

Oi! Over 'ere Guv! Fancy a nice quick way of getting the better of three of the Amiga's top games? Quick ways round Rainbird's *StarGlider*, EiderSoft's *Amiga Karate* and Mastertronic's excellent *Space Ranger*.

The patch program does not work from our disk menu so you have to double-click on its icon instead. You'll find Patch_#1 in the GameBusters drawer in the root directory of the cover disk. It's very straightforward to use, but if you do get stuck you'll find a documentation file in the same directory as the program, but with the usual .DOC extension. You'll also find further info in the 'Gamebusters' tips on pages 74/75.



FORMAT WARNING! This program directly modifies the games on disk, so only use it on a BACKUP. If you can't copy a particular game disk, don't use the patch on your original disk unless you want to have the cheat on it for good! We've been unable to test these pokes so you use them at your own risk. *ST Amiga Format* cannot be held responsible.

DROPSHADOW
Public Domain
All Amigas
ICON NAMES: DROPSHADOW, DROPSHADOW.DOC

How many times have you been working with the Workbench and cluttered up the screen with lots of windows? As you probably know, all those windows overlapping each other can get a little confusing. DropShadow helps you get over this problem by attaching shadows to every window. Not only is this very useful, but it looks a lot better than the standard workbench display.

For those into the technical side of the Amiga, DropShadow works by adding an extra bit plane to the workbench screen that is completely transparent to all other programs. This doubles the number of colours used by the Workbench to eight, the extra four being used as darker copies of the first four.

Once loaded, DropShadow opens a window containing two slider gadgets. One controls the depth of the shadows and the other, the darkness.

HOW TO USE THIS DISK

The *ST Amiga Format* cover disk is a special format disk which both the ST and the Amiga can read. Even if you are a seasoned computer user, please read these instructions carefully or you could permanently damage your copy of it.

The first thing you must do is make a backup copy of the disk. Because of the special format, the normal disk-to-disk copying methods, as recommended in the Amiga and ST manuals, won't work. Instead you will need to format a blank disk and copy the files individually. Don't panic, this isn't at all difficult.

ON THE ST (assuming a single drive machine)

1. Format a blank disk in the usual way.
2. With the blank disk still in the drive, double click on the A disk icon to open up the (blank) contents window.
3. Now drag the icon for disk B into the open window of disk A. This will copy all the files one by one off the master disk to your new disk. *Make sure that the master ST Amiga Format disk is write protected* (the sliding tab should be back so the hole is open) and put it in the disk drive when asked for disk B.
4. You will now be prompted at various times to insert disk A and disk B while copying takes place. There will be a lot of swapping to do on a single drive ST! Disk B should be the master disk, disk A your newly formatted copy.

If you want to cut down on disk swaps and understand enough about the GEM, you can set up a RAM disk using the utility provided on the July 1988 disk and use that as an intermediate step.

Note: our special format packs more programs onto a disk than would normally fit on a standard single-sided ST disk. You may not be able to fit all the files on one backup disk.

ON THE AMIGA (assuming a single drive A500)

1. Start your Amiga up with your normal Workbench boot disk.
1. Take a blank disk and initialize it in the usual way.
2. *Make sure that the master ST Amiga Format disk is write protected* and put it in the disk drive. Double-click on the disk icon that appears. Drag any icons you see in the contents window onto the 'RAM disk' icon.
3. When the disk activity light has gone out, put your newly formatted copy disk in the drive instead. Double click on the RAM disk to open its window up, and drag icons from that onto the new disk icon. This will copy the files one by one.

The programs may not all fit in the RAM disk at once on an A500 – do whatever will fit, then after step 3 delete them from the RAM disk by clicking once on each and, holding the right mouse button down, selecting Discard from the Workbench menu. Repeat steps 2 and 3 for the rest of the icons.

USING THE PROGRAMS

ON THE ST

When you turn the ST on and put your working copy of the disc in the drive, you will see a window opened with the contents of the disc displayed.

One of the icons is called CLICK_ME.PRG – just do what it says, double-click to run it. Up comes a list of the disk contents. Type the number of the program you want to run, and you are asked whether you want to read the disk help file or not.

You will now be asked whether you want to run the program or not. As an alternative to using CLICK_ME.PRG, if you know enough about GEM you can click directly on the icons for individual programs. These normally end .PRG with the documentation files having the same name as the program to which they refer, but with a .DOC filetype. Always read the documentation before running the program.

ON THE AMIGA

Most of the programs on the cover disk are run from the Workbench, which must be loaded first from your normal start-up disk. Once at the Workbench, put the ST Amiga Format disk in the drive and double-click on its icon to open it.

This month sees the introduction of an cover disk menu program. Click on the **CLICK_ME** icon to run it. This requires a couple of disk swaps, so just follow the on-screen requesters.

Most of the programs on the disk can be executed from CLICK_ME by selecting them from the menu and choosing either to view the program's documentation or load the program. If a program fails to load from this menu (this sometimes happens through shortage of memory on unexpanded systems) you can load it from the Workbench instead, by clicking on its icon.

To load a program from the Workbench, you must first click open the drawer which contains it. For detailed comments from the program's author click on the .DOC file icon in the same folder; to run the program click on the main icon.

When you click on a documentation file, a new window is opened and the text is displayed a screenful at a time. Press any key to move from one screenful to the next, or click on the close gadget in the top left-hand corner of the window to cancel the display.

The READ_ME icon gives you a brief summary of the disk's contents and how to use it.

DISK

DISK DOCUMENTATION

Many of the programs on *ST Amiga Format* disks are Public Domain. In such cases we've simply passed on their standard documentation files unchanged, as is customary in the PD code of practice. Some of the phrasings are 'idiosyncratic', shall we say, so please don't blame us for any misspellings!

ST MEGABLIT MINIBOOB

There is a small problem with the ST Megablit program from issue 2's cover disk. Although the program works quite happily with Degas files and creates its own graphics files in the prescribed manner, it won't load a colour file that it has previously saved. For those with colour monitors, who are experiencing difficulties, we've included an empty Degas format file on this month's disk.

Make copies of this file and load it into Megablit before you start work on a new picture. When you come to save the graphic, give it a different name and you will then be able to reload the file normally at a later date. Full instructions are included as a help file on this month's disk. Sorry for the inconvenience – we tested it with Degas files and on mono monitors!

WE WANT TO GIVE YOU MONEY!

If you've got any programs for either ST or Amiga which you think other readers would find useful, interesting or amusing, we'd like to know. Here's how to go about securing international fame for yourself:

1. Only send in programs on 3.5" disks; we cannot accept printed listings.

2. Make sure your disk is clearly labelled with your name and address and the program name(s), and is marked 'ST' or 'Amiga'.

3. Make sure there's a documentation file on the disk called README.

4. Enclose a clear covering note explaining what the program does, and if you possibly can please also send a printout of any on-disk documentation files. Remember your address and telephone number. Include a stamped return envelope for the disk if you want it back.

5. THIS IS IMPORTANT: there must be a signed statement that the program is yours and that you are prepared to assign publication rights to ST Amiga Format. Use the following wording:

"The program/s (write the title here) is/are submitted for publication by ST Amiga Format magazine. It is my own work and has not been submitted for publication elsewhere.

Signed ..."

If we accept your program, we will get in touch with you before publication to agree terms and payment rates. We will evaluate all submissions in a batch once a month, so please allow up to 40 days for return of your disks. We will only send back disks with adequate return postage and packing.

6. If you send us a disk with a virus on it, we reserve the right to send round the heavy mob in the small hours to do unspeakable things to your pet armadillo. Seriously, since we've already given you virus-killer programs (on July's disk), please do check your disks very carefully.

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REVIEW

PUBLIC KNOWLEDGE

The ST has a growing corpus of Public Domain programs from Britain, the States and Europe. Picking the best bits can save pounds, as Elliott Stein discovers when he ventures into the libraries.

Atari ST Public Domain software is a potpourri of programs, varying quite dramatically in quality.

Some PD software was actually sold commercially once. *Typing Tutor*, an excellent educational package from Academy Software, is very effective at teaching and re-enforcing touch typing skills. This is supplied with another program, called *Word Invaders*, a game to test your touch-typing skills.

Other PD titles are the beginnings of commercial products; *1st Word*, a GEM based word processor at some time bundled with early STs, later evolved into the best selling *1st Word Plus*. Though 1st Word has been overshadowed by more powerful (and expensive) WPs, there was a time when it was one of the best available for the ST and widely used.

ST Public Domain is finally at a point where it warrants a serious look – and where else to begin a serious look than the group of titles which may be the most useful of PD software: Utilities and Desk Accessories.

Utilities and desk accessories

RAM disks, print spooler and DA calculators appear to be the first stop-off for ST Programmers, and there is a ridiculous overabundance of them in the Public Domain.

The best RAM disk out of the legions is *Intersect* by Randy Mears, an ingenious program which cleverly sits in the desk accessory window and can therefore be turned on or off or resized at any time during a session. It is far more versatile than most of the others which have a fixed size and can only be removed when the computer is switched off or reset.

DC Format by Paul Lee and Keith Gerdes is probably the best of all disk formatting and copying programs. Not only will it format a disk in an extended format yielding more space, but, through its attractive user-friendly shell, it even formats and copies disks in PC or Magic-Sac formats (Magic-Sac is a Mac emulator for the ST)

Mono Emulator by Mick West (as provided on Format's issue 2 cover disk) can save users of colour monitors the price of a high-res monochrome one, as it persuades mono-only programs to run on a colour monitor. Though not as good as the real thing, it's certainly better than not being able to use mono programs at all.

There are several multi-function DA programs, like the well-designed *System* by Paul Camilleri, which features Printer configuration, RS232 set-up, colour palette, notepad, mouse and keyboard speed, clock and date set, disk formatter and even a command shell.

In business

Unlike PD for PC compatibles and the Macintosh, the ST has yet to establish a wide selection of quality word processors, databases and financial programs. The best of PD word processors on the ST include *1st Word* and *ST Writer Elite*, an updated and altered version of a non-GEM WP, originally bundled with early STs. Since the original ST Writer's release, programmer Bruce D. Noonan has added a GEM interface to it and cleaned up some of its early bugs. ST Writer is also available in French, Spanish and German versions.

There is one PD Database of commercial quality – *DB Master 1*, a program also originally bundled with early STs. It is a fully GEM-driven program in two shells, MAKEONE and USEONE, and features many of the facilities you'd expect from a good database, as well as some you wouldn't. Because of its convenient scrolling, its ability to handle large amounts of text and print out in ASCII, it is a perfect tool for writers who wish to outline and break down a novel or script.

Graphics

Now here is an area where PD certainly holds its own. There are several programs which rival commercial titles like *Degas* and *Art Director*. *Neochrome* is a low-res only program which was originally bundled free with the ST. The latest version 1.0 offers

DEMOS

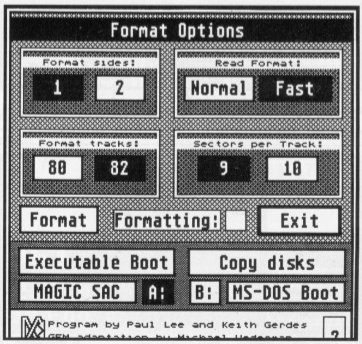
Lets face it – some commercial titles are pretty expensive. Unfortunately, you must often try a title before discovering its worth – and in order to discover its worth you must use it – AND BUY IT.

Not always so.

A large number of companies place demo copies of their products into public domain. These are often copies of the actual program with a few of its features disabled (often the 'Save File' options). This allows you try have actual experience with* VIP Professional, Zoom Racks, Tempus, Trimbase, Ez Track, DB Man, Superbase, Timelink, Graphic Artist, Campus CAD *and many other commercial titles, all of which offer demo versions.

Many games also do this, such as* Time Bandit, Flight Simulator II, Shanghai, Zork I, Airball and Star Wars, *all of which offer limited game play to help you get the feel of them before you lash out your hard earned money.

Perhaps the best demos come from graphic packages which merely display slide-show of work created from the actual program. The best of this type must be* CAD 3-D 2.0, Cyberstudio, Film Director *and* Aegis Animator, *featuring dazzling shows of various moving images.



■ *Fast Formatters abound in PD – DCFORMAT allows you to squeeze more space onto your disks by putting more tracks per side and more sectors per track.*

ODDITIES

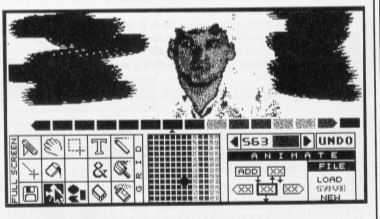
What do you call a program which reads an ASCII file using a software voice simulator? Programmer Delroyal Marks called it *Reader* and placed it in an easy-to-use GEM framework.

Star Map is a complete map of the solar system which allows you to zoom in on planets, obtain information about them and scan the stars. For musicians, there are PD programs from Desktop piano keyboards to sound chip editors, to 32 track MIDI-sequencers.

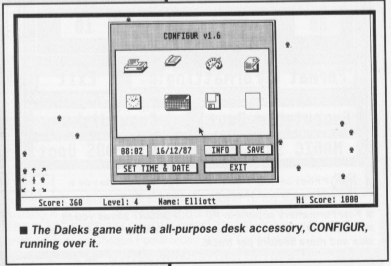
many new features, including shape generators, jackknife, rotation and flips. There is even the mysterious animation facility which can only be obtained by first selecting 'The Grabber' icon and using the right mouse button to click the pointer in the loop of the second 'R' in the word 'Grabber'. When this is performed, an icon of a Film Camera appears in the icon selection window.

Master Palette is a colour program which lets you use up to 512 colours on the screen at the same time (just like *Spectrum 512* and *Quantum Paint*). Though its features are limited, it's perfect for altering the limited colours of works originally created on Degas or Neochrome. There is also a wealth of graphic utilities which support and enhance well-known graphic packages, as well as programs which convert files from one graphic program to those of another.

AIM (Atari Image Master) by Frans Groen from The Applied Physics Department of Delft University of Technology isn't a drawing program but a technically advanced image manipulation processor of industrial quality. Running under GEM and featuring multiple windows and importation of Degas and Neochrome pictures, it is a must for any graphic artist interested in getting the most out of his/her art. WARNING: This is a very complex program and its use is made more difficult by its highly technical documentation.



■ *The little-known animation feature of Neochrome*



■ *The Daleks game with a all-purpose desk accessory, CONFIGUR, running over it.*

LIBRARIES

Luckily for PD enthusiasts there exist several libraries which specialise in collecting the best PD and shareware software from around the world.

For a reasonable fee all of the titles mentioned in the article and readily obtainable. Five libraries which have proven reliable and which constantly scout for the best in ST PD software are:

FLOPPYSHOP ST, 50 Stewart Crescent, Northfield, Aberdeen AB2 5SR (0224) 691824

PAGE 6, PO Box 54, Stafford ST16 1DR (0785) 213928

SOFTVILLE, 55 Highfield Avenue, Waterlooville, Hants PO7 7PY (0705) 266509

THE SOUTH WEST SOFTWARE LIBRARY, 5 Barn Owl Way, Stoke Gifford, Bristol, Avon BS12 6RZ

STAR UK, 50 Bridge Street, Aberdeen, Scotland AB1 2JN (0224) 593024

There's no recognised cataloguing system for ST PD, as there is with the Amiga's Fish Disks. You'll need to contact a supplier and request the programs you're after by name. Please tell them where you heard of their services.

To complement the wide variety of art packages there is a good supply of sample pictures in Degas and Neochrome formats, as well as plenty of digitised images.

Games

One of the most popular areas of ST PD. The micro's advanced features make it an attractive challenge to any games programmer. There are many ST versions of traditional games: Blackjack and other card games, Connect 4, Backgammon, Yahtzee, Othello, Tic-Tac-Toe, as well as a realistic simulation of the popular board favourite *Monopoly*.

Krabat is an excellent chess program from Germany, featuring attractive board icons, mouse operation, GEM menus and varying levels of difficulty. Though the documentation is in German, the program is easy to use and compares well with commercially produced computer chess games.

Laserchess is a two player variant of chess, featuring chess pieces armed with lasers and others with mirrors to deflect the beams. There are also ST versions of popular old computer/video games: *Megaroids* – a superior version of Asteroids (as supplied on the first Format Cover disk), *Pacman- the best version of the grand video game yet*, *Diamond Digger* – a Bolderdash clone with 25 levels, dozens of Breakout type games and traditional space shoot-em-ups such as *Azarian*, *Damonoid* and *Orion's Run*.

As well as the games, there are utilities for commercial games, such as the *Arkanoid Construction Set* which lets you design new *Arkanoid* screens. There are also special 'cheat' utilities for popular titles like *Gauntlet*, *Barbarian* and *Time Bandit*.

Another fine selection of PD games are the Infocom-style text adventures like *Monty Python and the Holy Grail* and *Once a King*. For those who don't want to play other people's text adventures there is *The Adventure Writer* system by David Betz, a complete programming language to design text adventures of your own.

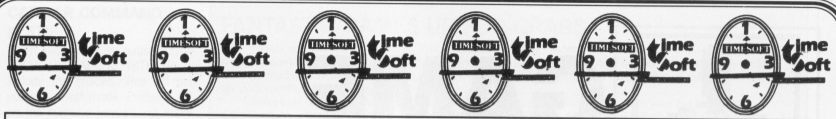
Many of the PD games are of excellent quality and would probably be sold commercially on 8 bit computers. Though many PD titles like *Daleks*, *Stone-Age* and *Firestorm* are challenging and well-thought-out games of skill, they haven't the dazzling graphics and innovative play of the more popular commercial ST games.

Languages and comms

You can find a PD version of most computer languages: BASIC, Logo, Lisp, C, Forth, Pascal and others, many with helpful documentation on disk. There are also assemblers and disassemblers, text editors for programmers and other utilities, such as a one to convert GFA BASIC to *S T BASIC* or *Fast BASIC* (and vice-versa). In addition to the languages themselves, there are hundreds of sample source programs. For modem users there are full-featured communications programs like *Uniterm*, which contain most of the features of commercial programs. *FST104* simulates Prestel graphics and *DTE* is a VT100 Terminal Emulator for Compuserve B – protocol. In addition to the many terminal emulators, there are versions of *Kermit*, utilities for compressing and de-compressing files and even full-featured BBS programs like *Starmet BBS* for those considering their own bulletin boards. In short, there's everything you'll need in PD for communications except the modem itself.

Others

There are also animation programs, children's games, label makers, icon construction kits, hard disk utilities, magazines on disk, ham radio utilities, biorythms, multi-tasking, digitised music, fractals, Desktop fonts and many others. The best way to find out for yourself exactly what is available is to send for the catalogues offered by the PD suppliers.



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When the play's so frustratin, ya feel ya gonna burst; when your teeth start gratin and ya desperately need a first; where ya gonna go? Gamebusters! More thrills and exposes than Lady Godiver's trot down Coventry high street.

STARGLIDER ■ *Amiga*

For invincibility, launch your ship, press [F][A] for fixed cross hair, slow down to zero velocity and press [Backspace] to pause the game. Type JS ARG S. Pause the game again and type JS ARG S. You can tell if the cheat is active as all the instruments will go to the centre position. You can now fly around and blow things up without worry.

Press [M] if you want to be really lazy. This halts the aliens allowing you to give them hell. Another stab at [M] will restart the beings from outer space.

Missiles are topped up by pressing [P], an object editor is reached by pressing [Z] (which allows you to spin and zoom in on any of the vector graphics).

Jamie Kennea
Portsmouth, Hants

SINBAD AND THE THRONE OF THE FALCON ■ *Amiga*

When earthquakes or storms appear, double click on the quit box in the left corner of the screen. Double click on the Resume Game option from the Game Utilities menu when it appears. You will find that the earthquake or storm has disappeared.

Paul Wilson
Reading, Berks

HOLLYWOOD POKER ■ *Amiga*

Load the game as usual; when the drive light goes out press [Ctrl][Amiga][Amiga] to reset. When the game loads for the second time you will find the two girls in the first round are very easy to beat.

Jason Fox
Billingham, Cleveland

INTERCEPTOR ■ *Amiga*

Load the game normally until asked for LOG DISK. Remove the original disk and make sure it is write enabled. Replace original disk and press return. From now on you have access to all missions.

Angus Northcott
Midlothian, Scotland

LEATHERNECK ■ *ST*

Type in CUTHBERTNECK then press F3; all your men will have protective shields. Nothing can harm you now except your buddy's bullets in your back.

C Warren
Yarmouth, Norfolk

SAPIENS ■ *ST*

Starting Out – when creating your character it is best to dish out a lot of charisma. This should make it easier to find a companion (you'll need one to complete it). Once you're used to the odd controls, talk to the chief using the 'What do you want?' option. He will tell you of your first quest.

Food and Water – food can be obtained by killing rabbits, wolves, chickens and bears. Water skins (very valuable) can be obtained by trading other items. Water holes are dotted about the landscape. There is one towards the southern edge of your village. As soon as you see 'the gurgling of a spring!', press the right mouse button. Use the 'Take' option.

Trading and Conversation – be nice to other members of your tribe. You'll need items from them, such as water skins, flint knives, food and other weapons. Always tell them your name and end the conversation with 'Good Hunting'.

Combat – squat down and let your attackers come towards you. When they get close, hit 'em. Remember you can change weapons by pressing the right hand button. It's a good idea to carry a hatchet and several assegais.

Movement – always use the 'Landscape View' for travelling and the 'Lateral View' for reading messages. If you're travelling straight and press the left button, a map will appear.

The Quests – these are obtained from your tribe leader. Once completed, you have finished the game. For the first you must kill as many wild animals as possible and take the meat back to the chief. Quest two has you travelling to the Eagle Eyes tribe and swapping a rabbitskin for a magic potion. In quest three you must reclaim a stolen axe from the Stone Arms tribe. Finally for quest four you must recapture the Holy Rod from the Crazy Hyenas. Take the Rod back to your chief, but make sure you have 12 or so assegais. And that's it.

Tribe Locations – white plumes of smoke seen from the 'Landscape View' mark tribe locations. They appear grey on the map. Eagle Eyes are situated north east of your tribe. Crazy Hyenas involve a long journey north west of your tribe. Stone Arms are south of the Crazy Hyenas.

Kirk Ruebotham
Runcorn, Cheshire

CARRIER COMMAND ■ *ST*

When the game is paused type GROW OLD ALONG WITH ME – include the spaces. This will put you in a cheat mode. Pressing [+] on the numeric keypad will make your Mantas and Walrus immune to missiles and collisions. The minus key, [-], deactivates this.

Lucien Oppler
London SW1

FANTASTIC GAMES UP FOR GRABS

Tips, cheats and game-busting ploys. Yes, We want the lot. If you've discovered a secret password, written a poke, mapped a game, completed an adventure, found ways of getting high scores or know of any underhand method that lets you win, send us details. By doing so you could win a collection of the best new games for your machine, ST or Amiga.

Interested? Well stop gawping. Get your game busters to us. Send them, with your full name, to Gamebusters, ST/Amiga Format, 4 Queen Street, Bath, BA1 1EJ. Please state whether tips are for ST or Amiga. Try and make tips short and snappy – we want to know how to complete the game, not a tome on house-training armadillos (I have the three-volume edition of J.Buttocks 1914 treatise, The Dry Armadillo, already – Ed) (So you keep saying – Other Ed). Pokes can be any length as they will be included on the cover disk rather than printed. If a poke is very long please send it on a 3.5" disk, and enclose a jiffy bag and return postage if you want it back.

We have had so much good stuff that we've had to hold a lot of it back. Don't worry, it will appear eventually. Keep sending in those crackers.

FLIGHT SIMULATOR II ■ *Amiga*

Landing the plane in a short space – for instance, on Alcatraz: Proceed to land as normal. Just before touching down, keep your fingers pressed on the brakes (key 1). The plane should virtually stop dead when the wheels touch the ground.

Overshooting – to prevent yourself landing in the drink, select the time on the dashboard and alter it to early morning (somewhere around 1.30am). The plane will roll off the runway and into the sea without crashing. This gives you another chance to taxi onto the runway.

Curious co-ordinates – San Francisco area; N:17429.046, E:5074.8619, A:17.0000 (N=north, E=east and A=altitude).

Changing plane colour – select the multi-player option from the file header and change the colour in the box by clicking on the appropriate box icon.

Getting fuel – fuel can begin to leak forcing you to land during a Realism game. If you are close to a depot, but do not have enough fuel to taxi (in other words you have come to a complete standstill) try the following: very quickly tap the up/down gear toggle ([U] key). The nose should drop as the wheels are lifted off the ground, and then lift once the wheels drop. The plane will start to move. Continue doing this until you reach the depot.

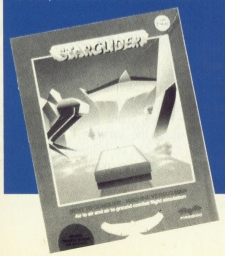
Shane Parris
LLanelly Hill, Gwent

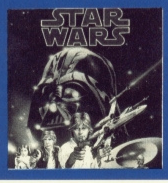
CHEATS ON DISK

Have we got some sizzling cheats for you this issue! And not only for the ST, but the Amiga as well. Surely a first for Amiga owners. Format Health Warning: we can't be held responsible if you trash your original game disk. Instructions for cheats are held on the disk. Read them carefully before doing anything.

!YAmiga – cheats for *Star Glider* (infinite shields), *Amiga Karate* (infinite men) and *SpaceRanger* (no collision detection). Reset the computer and insert your Workbench disk. Replace this disk with the cover disk. Click the `COVERDISK#3` icon and then the GAMEBUSTERS drawer when it appears. Double click on the `PATCH_#1.DOC` file. Follow the instructions from there. Make sure you do read the instructions – as we pointed out earlier, we can't be held responsible for your actions. The Amiga cheats write to disk, so make a backup of your original disks before using them.

ST – *Xenon* (invincibility and start-on-any-level options) and *Star Wars* (infinite shields) this month. Reset your machine and place the cover disk in the drive. Double-click on the POKES folder when the desktop comes to view. Two new folders, STARWARS and XENON, will be displayed. Click on the required one and then click on the .DOC file inside. Follow the instructions from there. These two pokes don't write to disk, but that's no reason to use them on with your master disks.





THIS MONTH'S WINNERS

D.Sanger for his great game-busting pokes for Star Wars and Xenon. He wins lots of lovely ST titles reviewed in this issue.

Shane Parris for taking the wind out of Flight Simulator II. All the Amiga aces will be flying his way.

ARKANOID ■ *Amiga*

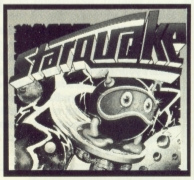
Pause the game and type DSIMAGIC. A cylinder will roll down, catch it and type [L] for lazers, [C] for glue and so on. Pressing [F] takes you directly to the final screen.

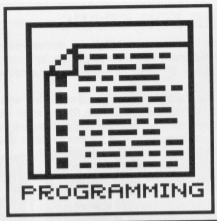
Jamie Kennea
Portsmouth, Hants

STAR QUAKE ■ *ST*

Teleport names: TABET, HINDI, KWANG, ROHEA, TSOIN, FLIED, NICHA, IVANG, CHING, SOCHI.

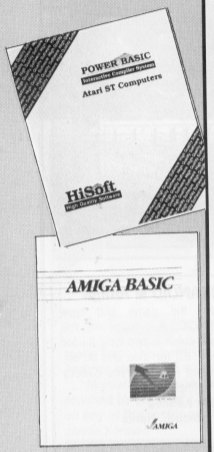
Dave Collins
Salisbury, Wiltshire





LEARN BASIC

Loops and branches this month, and who better to lead the way than our very own BASIC horticulturalist, Richard 'Green Thumbs' Monteiro



No time for introductory waffle this month: there is much to cover and little space to do it in.

When it comes to repetitive tasks or testing for particular occurrences, nothing does it better than a computer. Especially a computer with BASIC in control. Say you wish to print a character 5 times. You could write a program like this:

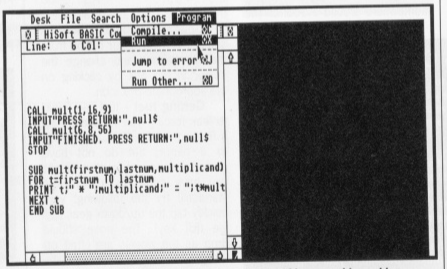
```
PRINT "*"
PRINT "*"
PRINT "*"
PRINT "*"
PRINT "*"
```

It works, but what a waste of time, space and energy. Wouldn't it be easier if you could issue the command once and somehow tell the computer to repeat it a given number of times?

You can. By using what is known as a FOR..NEXT loop. You could replace the previous five lines with:

```
FOR a=1 TO 5
PRINT "*"
NEXT a
```

The variable following FOR is used as a counter; in this case it will hold in turn the numbers 1 and 5 (as the command says A=1 TO 5). PRINT "*" is executed once for each value of a (ie 5 times). The NEXT command sends the program back to the matching FOR at the start of the loop, where the counter variable is incremented. This sequence repeats until the value of the counter variable exceeds the finishing value (5 in this case). When this happens, the program continues from the instruction immediately following NEXT.



■ *LEARN4.BAS, a short database showing the power of loops and branching*

Of course, the variable needn't be a; Armadillo, IS, X, Ed or tRuTh are other valid examples. You don't have to count from 1 to 5, either, of course:

```
FOR count=1 TO 5
PRINT "*"
NEXT count

FOR a=1 TO 234547
PRINT "*"
NEXT a

FOR axolotl=23 TO 34
PRINT "*"
NEXT axolotl
```

Counting backwards

Almost anything can be enclosed in a FOR..NEXT loop – there is little restriction. Even other FOR..NEXT loops are acceptable:

```
FOR a=1 TO 10
    PRINT "Outer loop"
    PRINT "a=";a
    FOR b=32 TO 127
        PRINT "Inner loop"
        PRINT "b=";b
    NEXT b
NEXT a
```

When one FOR..NEXT loop is put inside another, it's referred to as 'nesting' the loops. The important thing to remember is that the last loop to be opened should always be closed first. The following example is wrong and the computer will normally report an error if you try and run it:

```
FOR a=1 TO 10
    FOR b=2 TO 5
NEXT a
    NEXT b
```

So far all the loops have counted up, with the counter variable increasing in value as the loop repeats. A FOR..NEXT loop can be made to count down, though, by using the STEP command. For example, the command FOR t=34 TO 1 STEP -1 will count down from 34 to 1, using the variable t as the counter. STEP can be followed by any positive or negative number (within BASIC's

FIRST TIME FOR BASIC

Using BASIC for the first time? Here's how to get the program up and running:

Amiga BASIC first: Reset the computer and insert your Workbench disk into a drive. When the Workbench appears replace the disk with the Amiga Extras/Amiga BASIC disk. An Extras disk will appear. Double click on this icon and wait for the contents window to appear. Double click on the AmigaBASIC icon when you spot it. Amiga BASIC is now ready to use.

Now for Power BASIC: Insert either issue 2's cover disk or Hisoft's Power BASIC disk and press the reset key. If you're using the cover disk, double click on the CLICK_ME.PRG icon when it appears and select Power BASIC from the menu. For the full version double click on the PBASIC.PRG file icon (or HBASIC.PRG if using the HiSoft BASIC package). You're now ready to roll.

Read the rest of the article to find out how to create BASIC programs.

limits), so you count up or down in steps of more than 1:

```
FOR f=20 TO 10 STEP -2
   LOCATE 1,1
   PRINT f
NEXT f

FOR u=1000 TO 2000 STEP 10
   LOCATE 1,1
   PRINT u
NEXT u
```

The STEP command decrees the exact increment or decrement of the counter variable. In the above examples, f starts at 20 and then takes the values 18, 16, 14 etc, and u starts at 1000, increasing in steps of 10 to 2000.

Loops have many uses other than printing. Their very useful for timings, searching, plotting – in fact anything that requires a lot of repetition.

Over and over again

In longer programs it is often necessary to execute a particular set of instructions from different points within its body. For instance, you might want to set the screen colours at the beginning of your program, change them at some other point, and then return them to their initial values. You could write the lines of instructions to do this at each of these points in your program. If you do though, your program will get very long an get increasingly hard to follow. There are three programming structures which help to ease this problem: GOTO, GOSUB..RETURN and CALL SUB. The simplest of these is the unconditional branch command, GOTO (it's also the one least liked by theoreticians because it's so easy to abuse:

```
PRINT "Start"
GOTO there
PRINT "Sniff, I won't ever
be printed"
there:
PRINT "End"
```

The parameter following the GOTO command tells BASIC where to jump to in the program. There must be an equivalent 'label' somewhere else in the program with the same name, and followed immediately be a colon. In the example, BASIC prints the word 'Start' and then jumps to the label 'there:', as the GOTO command tells it. In doing so, it misses out the middle PRINT line. Finally, BASIC prints 'End'. Indiscriminate use of GOTO, although it allows precise control of the flow of instructions, can make a program very difficult to follow.

GOSUB is altogether a much more powerful structure, as it provides a way of branching to another section of a program and then returning *to the place from where it branched.* The section of code referred to by the GOSUB command is called a 'subroutine', and is marked out by a label at its start (much like the label used with GOTO) and the word RETURN at the end. Sounds confusing? Have a look at the following example:

```
GOSUB say_hello
PRINT "and again..."
GOSUB say_hello
PRINT "Finished"
END

say_hello:
PRINT "Hello"
RETURN
```

Subroutines may appear anywhere in a program, but it is best to distinguish them from its main body by putting them at the end of the program. As BASIC normally moves automatically from the current instruction to the one below, it will run straight into the first subroutine unless you cordon it off with a STOP or END statement. You can call subroutines from within other subroutines, and even nest them, though nesting can lead to readability problems like GOTO.

An alternative to the subroutine in modern BASICs is the 'subprogram'. The structure is similar to a subroutine but uses the keywords SUB, END SUB, CALL and STATIC:

```
CALL print_table(2,12,7)
PRINT
a%=2
b%=12
c%=9
CALL print_table(a%,b%,c%)
PRINT "DONE"
END

SUB print_table(x%,y%,z%)
STATIC
FOR d%=x% TO y%
PRINT d%;" * ";z%;" =
";d%*z%
NEXT d%
END SUB
```

Anything between SUB and END SUB constitutes the subprogram. CALL causes a jump to the start of the subprogram, but also passes the contents of a list of variables to it. These values can then be used within the subprogram.

The values themselves can either be passed as numbers, as with 2, 12 and 7 in the first part of the example, or by assigning the values to variables and passing the variables to the subprogram, as in the second part. The variables needn't have the same names as those used in the subprogram, but they must be in the same position in the list that's passed, and in Amiga BASIC they must be of the same type. You can't, for instance, pass a string to a numeric variable, or even an integer to a real variable. The example used all those percentage signs to ensure all variables are treated as integers.

The SUB instruction is particularly powerful when used with STATIC (Amiga BASIC demands this keyword in a sub-program header) as any variables defined within that sub-program are then treated separately from any used in the main program, even if they have the same names. Try adding the line d%=100 before either of the CALL instructions, and PRINT d after it. The value returned will still be 100, even though the subprogram uses a variable called d for its own purposes.

This independence opens up great possibilities: libraries of routines can be written and later merged with many different programs. The variables used in the library routines are guaranteed not to interact with those in the rest of the program.

As well as forcing programs to branch with the GOTO, GOSUB and CALL commands, they can also be made to branch depending on the results of a test. But now we're treading in deep water – something for next issue.

TROUBLE WITH LOADSADOLLARS$

Did you get any Syntax errors when trying the line LOADSADOLLARS$=STRING$("$",17) published in last month's magazine?. You will have done if you entered it exactly as printed – that's "cos it's wrong. Try swapping the positions of "$" and 17 to get LOADSADOLLARS$=STRING$(17,"$"), which is right.

LISTINGS ON DISK

To give you more of a feel of branches and loops, we've included several programs on this month's cover disk which use these commands, as well as those covered in the first issue.

LEARN1.BAS – a demonstration of loops and branches.

LEARN2.BAS – works out multiplication tables and shows that too many GOSUBS can be bad business.

LEARN3.BAS – the same program as LEARN2.BAS, but with the GOSUBs stripped. Much shorter, much more readable and much faster.

LEARN4.BAS – a short database with jumps and loops galore. Also several commands you may not understand. Don't worry, they'll be explained in future articles.

Loading listings into AmigaBASIC: reset your Amiga and insert a Workbench disk. When the WIMP environment appears, replace the Workbench disk with your AmigaBASIC disk. Double click on the AmigaBASIC icon after clicking on the Extras disk. AmigaBASIC then loads. Go to the Project menu and select Open. Click on the Filename requester box, insert the cover disk containing the BASIC files, type in the required filename (LEARN1.BAS, LEARN2.BAS, LEARN3.BAS or LEARN4.BAS) and press [Return]. You can run the program by clicking inside the BASIC window and typing RUN (not forgetting to press [Return] afterwards).

Loading listings into PowerBASIC (August demo version only): reset your ST and place the cover disk in the drive. Double click on the CLICK_ME.PRG file icon when it appears. Choose Power BASIC (F1) from the menu. When it has loaded you can load one of the sample programs by selecting Load from the File menu and double clicking on any .BA files (LEARN1.BA, LEARN2.BA, LEARN3.BA or LEARN4.BA) that appear in the file selector box. The chosen file loads ready for running (pick Run from the Program menu).

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SUPER TOOLS

Richard Monteiro Twists again as he gives the Wercs to a couple of ST programs designed to take the pain out of WIMPing, and Jason Holborn looks at Turbo Print and K-Gadget for the Amiga. Plus the pick of the best new technical books.

TWIST

£39.95 ■ ST only ■ HiSoft, The Old School, Greenfield, Bedford, MK45 5DE (0525 718181)

Flipping between applications or programs is nothing new; commercial packages (*K-Switch2* and *Juggler*, for instance) and even PD offerings have been touting such features for a long while. So why are HiSoft flogging a dead armadillo? Put simply, to improve and expand on existing offerings.

The ST – or rather its operating system, GEM – can normally only keep one program running at any instant. Enter *Twist*. Its role is to act as mediator for a pride of programs. Twist allows several programs to be stored in memory with just one of them active at any time. The active file can be swapped at any moment for another of the files held in memory.

So what makes Twist special? Well, the ability to flip between anything up to 14 programs (memory permitting, of course), keeping track of resolutions and colour palettes, install RAM disks and create complex configuration files that will automatically load files into memory or RAM disk ready for Twisting, must make it the most powerful application switcher around.

Programs are installed by picking 'Install' from Twist's menu bar. An alert box requests a memory allocation for the program (usually 100K more than the file size, although this varies from program to program). And that's it. The program loads and run as usual. The only difference is that pressing a combination of keys either switches control to another application stored in memory or passes control to Twist.

Most programs that stick to the constraints of GEM work without trouble. On a 4Meg ST we managed to swap between *GFA BASIC*, *GFA BASIC Compiler*, *Power BASIC*, *Devpac ST*, *Protext*, *First Word Plus*, *Degas Elite* and *Fleet Street Publisher*. HiSoft's switcher won't work with commercial games, accessories or programs that create their own custom screens. For program development, desktop publishing, reviewing (word processing) and other applications that require much toing and froing, get down to the Twist.

features	**4.0**
performance	**3.5**
ease of use	**4.0**
manuals	**3.5**
format verdict	**3.5**

Twist in mid-flip, exiting from one application and jumping straight into another.

EARLY BIRDS

The review versions of Twist and WERCS were pre-release, and we did encounter one or two 'operational errors'. HiSoft assure us these will be resolved before release. What we saw was good. When released they should be very good.

TURBOPRINT

£29.95 ■ Amiga only ■ George Thompson Services, Dippen, Brodick, Arran, KA27 8RN (077 082 234)

Those who do a lot of printing on their Amigas will be pleased to hear about a new utility called *TurboPrint*. It claims to speed up the printing of screendumps by up to ten times, through the use of custom written 'Turbo' printer drivers.

Loading TurboPrint involves booting your Amiga from the TurboPrint disk, whereupon it installs itself automatically and resets the machine, so letting you carry on as normal. The nice thing about TurboPrint is that it remains active even after a soft reset or a guru error.

TurboPrint's main claim to fame is that it enhances printing from any Amiga package with no modification to the program. The package achieves this by having all the printer drivers and the `PRINTER.DEVICE` program written completely in 68000 assembler

Also on the TurboPrint disk are two other programs, *TurboPrefs* and *NoTurbo*. TurboPrefs is a separate preferences program written to complement TurboPrint. From TurboPrefs, you pick the particular Turbo driver for your printer from an extensive list which includes drivers for Star, Epson and NEC machines. The NoTurbo program, as the name suggests, allows you to turn off TurboPrint.

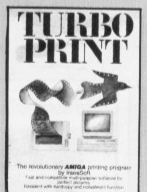
TurboPrint works via 'HotKeys'. For example, pressing [Ctrl][Alt]A dumps the current screen, regardless of format, to your printer. The speed and quality of the resultant dump is very high. For example, printing the same graphics file to a 9-pin printer took these times:

Workbench 1.2 drivers	210s
Workbench 1.3 drivers	90s
Turbo Print drivers	120s

Turbo Print performed two passes of the print head, increasing the printer's apparent quality. The Workbench 1.3 drivers are slightly faster but poorer quality.

If you're after replacement printer drivers to speed up graphics printing it may well be worth your while waiting for the official Commodore Workbench 1.3, which features enhanced printer drivers. If, however, you're after a fast screen dump utility for any Amiga program at any time, TurboPrint is definitely worth a look.

features	**3.0**
performance	**4.0**
ease of use	**3.5**
manuals	**3.5**
format verdict	**3.0**



K GADGET

£29.95 ■ Amiga only ■ Kuma, 12 Horseshoe Park, Pangbourne, Berkshire, RG8 7JW (07357 4335)

The Amiga's Intuition was designed to be the most flexible WIMP system on any machine (*dreams, dreams – Ed*), but this flexibility comes at a price. If you've ever programmed Intuition you'll know that it involves setting up a large number of data structures before you even start to get anything worthwhile. The more complicated your Intuition-based application becomes, the more data structures have to be set up and after a while all this can get very tedious indeed. To take the tedium out of Intuition, Kuma have released *K-Gadget*, a program that allows you to carry out all this setting up from within the comfort of a program generator.

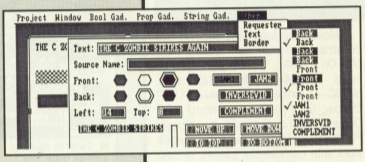
K-Gadget is a Gadget and Requester editor that lets you build your Gadgets or Requesters on-screen and then save them to disk either as an ASCII file that can be reloaded later for further editing, or as C source code for inclusion in your own programs. A file saved as C source is automatically given a `.h` extension. This file can then be called into your own programs with the C pre-processor command, `#include`.

K-Gadget has the ability to edit Boolean, Proportional and String Gadgets as well as all the attributes of a Requester, such as its position, size, name, borders etc.

When you create a Gadget or Requester, K-Gadget displays a small 'parts' window containing icons of all the different Gadget types and of a Requester. To create a particular Gadget or Requester involves clicking on its icon and dragging it onto the work area. Once this is done, all the attributes for that particular Gadget or Requester can be set from the pull-down menus. When all the flags for a Gadget have been set up, K-Gadget allows you to edit its appearance. Requesters too, are well catered for as K-Gadget allows you to edit their borders and text so your Requester will have that 'personalised' look.

If you already know Intuition fairly well, then the time-saving you can achieve using K-Gadget makes it a recommended purchase. If you are just starting out with Intuition, you should wait a while before buying K-Gadget as the package assumes you're familiar with the principles behind the environment. If you know nothing about Intuition and think K-Gadget will do all the work for you, you're mistaken.

features	**4.0**
performance	**3.5**
ease of use	**4.0**
manuals	**4.0**
format verdict	**4.0**



WERCS

£29.95 ■ ST only ■ HiSoft, The Old School, Greenfield, Bedford, MK45 5DE (0525 718181)

Most things WIMP can be bullied into any shape or size: menu bars can have any number of options, dialog boxes can fill a few square inches or the entire screen, alert boxes can contain icons, text or both, and icons can be any design. To produce this sort of environment requires a lot of work and a lot of data. WERCS – WIMP Environment Resource Construction Set – allows you to create and edit GEM resource files which hold all the WIMP data.

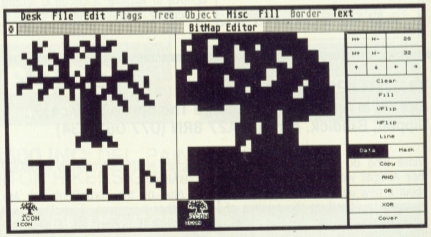
Doubtless you'll have seen files with the extension .RSC. These are resource files which contain the tree structures defining how a particular program interacts with the user. They are used by GEM AES (Application Environment Services) for producing menus, dialog boxes and other GEM-like things. Each resource file contains one or more trees. And each tree consists of objects of a distinct type, use and appearance.

The first stage within WERCS is to create a new tree. The choices are Form (dialog box), Alert, String, Menu and Image (Icon). From there you can add objects to the tree: boxes, buttons, icons, images, strings, text. Several trees can be held within WERCS; these may be altered at any time. When you're happy with your arboretum you can save it, along with a header file, and integrate it later with a program in a language of your choice.

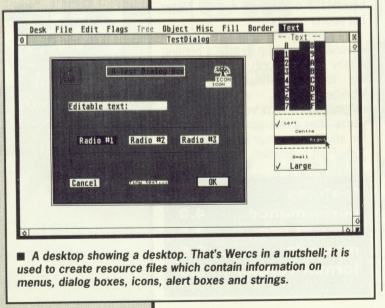
That's a brief overview of WERCS; each object can be pruned to your exact taste. For instance, objects can be moved and sized, flags (the ticks that appear in menus) can be assigned to menu options, boxes can be bordered in various styles, text can appear in numerous colours and sizes, and icons may be edited.

WERCS takes the tedium out of AES programming. It's friendly, comprehensive (it even lets create your own objects) and is the only resource editor available to the public (*something of an advantage in itself – Ed*). Strictly for technocrats.

features	**4.0**
performance	**4.0**
ease of use	**3.5**
manuals	**3.0**
format verdict	**4.0**



■ ***Icons can be created for inclusion in dialog boxes. Editing features include flipping, zooming, ANDing, ORing and XORing.***



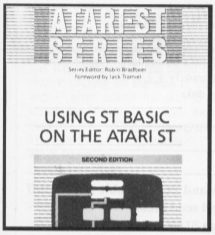
■ ***A desktop showing a desktop. That's Wercs in a nutshell; it is used to create resource files which contain information on menus, dialog boxes, icons, alert boxes and strings.***

BOOKSHELF

USING ST BASIC ON THE ATARI ST

Dick Meadows ■ £7.95, paperback, 190 pages ■ Glentop Press ■ ISBN 1-85181-179-6

Topics covered: simple PRINT and INPUT commands, drawing shapes, loops and jumps, mathematical functions, arrays and even writing full-length programs.



Dick Meadows is credited with writing many research papers and articles – it shows. The programs detailed are perhaps too practical: measurement converter, income tax calculation and loan repayment. Gripping stuff that is bound to keep you interested in BASIC programming.

While the book is good for first-time and reasonably competent BASIC programmers, those wishing to access all things WIMP will be disappointed: there is no mention of how to interface with GEM. Perhaps the pages wasted on a forward by Jack Tramiel, an introduction by the author and a preface by the editor could have been put to better use.

FIRST STEPS IN 68000 ASSEMBLY LANGUAGE

Robert Erskine ■ £12.50, paperback, 278 pages ■ Glentop Press ■ ISBN 1-85181-081-1

Many will spend hours arguing the pros and cons of BASIC and BCPL, C and Cobal, Pilot and Prolog; but at the end of the day all they really want is something that produces fast, compact and ideally machine-interchangeable code (assuming the same processor). None of the high level languages really deliver. Assembly language programming is the only way to guarantee short, speedy machine-code programs. 68000 assemblers are available for both ST and Amiga, with the the same syntax on both micros. Glentop's book doesn't assume you have any particular 68000-based computer which is good, but does mean you will need additional literature to access your particular micro's hardware.

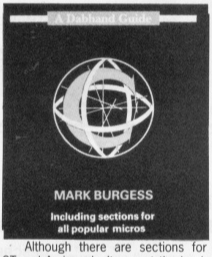
Recommended to anyone starting the arduous assault on assembler. Register layout, register addressing, position independent code, addressing modes, exceptions and everything the learner 68000-coder needs to know.

C: A DABHAND GUIDE

Mark Burgess ■ £14.95, paperback, 510 pages, Dabs Press ■ ISBN 1-870336-16-X

One of the few books available that is as useful to the beginner as it is to the experienced programmer. The book takes you through the basics of C in a clear and concise manner, and it includes sections for all the popular machines; ST and Amiga included.

Scattered throughout the book are numerous examples that, are helpful but do suffer from typographical errors – unacceptable in C source.



Although there are sections for ST and Amiga, don't expect the book to teach you all about C on your particular machine, these sections can only really be thought of as an added bonus.

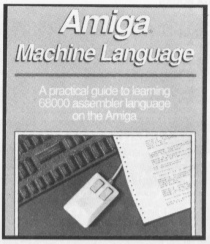
AMIGA TRICKS AND TIPS

Bleek, Maelger, Weltner ■ £19.95, paperback, 340 pages, Abacus ■ ISBN 0-916439-88-7

This book incorporates a high level of technical content without leaving the safety of AmigaBASIC. Most reference books for the Amiga present the machine either from C or from machine-code. It is therefore nice to find a book that gets fairly technical without leaving the Basic programmer in the dark.

It includes sections on AmigaDOS and the WorkBench, and it comes as a pleasant surprise to see the IFF file format discussed in some depth.

If you program in Basic and would like to dig deeper into the Amiga without having to learn either assembler or C, *Amiga Tricks and Tips* could be just what you're looking for. A must for the AmigaBASIC programmer.



AMIGA MACHINE LANGUAGE

Stefan Dittrich ■ £19.95, paperback, 254 pages, Abacus ■ ISBN 1-55755-025-5

AMIGA ASSEMBLY LANGUAGE PROGRAMMING

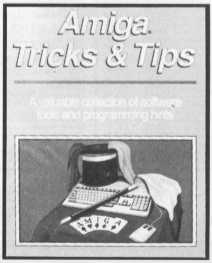
Jake Commander ■ £13.95, paperback, 232 pages, TAB Books Inc ■ ISBN 0-8306-2711-1

Both books start by introducing the reader to Assembler and then move on to the 68000 and its instruction set. Sadly Abacus's book rushes through this all-important beginner's stage with only an overview of the 68000.

Abacus's book has the most Amiga-specific information, but sacrifices detail for content.

The problem with both books is that they list all the routines available in the Amiga ROM kernel, but make no attempt to explain what the routines actually do! Therefore you'll have to buy the ROM kernel manual, Libraries and Devices (which will set you back £35) to be able to use the ROM kernel routines fully.

Both books will teach you 68000 assembler, but for your money, the Jake Commander book is the one to choose. Abacus's book, although packed with information, does not go into enough detail. It's better to know a great deal about very little, than very little about a great deal.



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Allternatively, you can go direct: Glentop are on 01-441 4130; Abacus books are available thruogh Precision Software (01-330 7166); TAB books are through John Wiley (Freefone 3477).

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DESKTOP

TIPS

Psst! Wanna know secrets about your ST? Well, roll up, roll up. We have lots ot tips, big ones, small ones, useful ones, weird ones; as you know a dodge a day keeps the disk doctor away. Read all the bits the manuals don't want you to see. Prolific tipster Jamie Williams from Grays, Essex, wins the £30 prize this month for his three neat ideas.

Oids off

The Oids demo, present on issue one's cover disk, crashes with a 'Graphics Boot' error when you die or complete the demo. To prevent this happening, load the demo by double clicking on the disk B icon and – when asked for disk B – insert the cover disk and then click on the OIDS.PRG program. The demo will work correctly.

Mr Y Pang
Orpington, Kent

Creating a game

On disk B of Mastertronic's Sidewinder game exists a file called EDITOR.PRG which allows you to change all the game's levels. Follow these steps:

Make a backup of disk B (format a disk and then drag the disk A icon onto the disk B icon – further details in last month's BEGINNER'S CORNER). Write protect and disregard the original. Insert your copy of disk B and double click on EDITOR.PRG. The file will load along with the first level of the game. All the pieces consituting the landscape will be on show. By moving the joystick it is possible to scroll through the entire level (the functions keys F1 through F5 load in respective levels).

Holding the fire key causes the program to cycle through the various blocks making up the level; releasing fire will drop part of the landscape onto the current level position. Using this technique it is easy to alter a level's layout.

Once you have finished changing a level you can save it to disk by holding both mouse buttons. To play the edited game simply insert your original game disk as usual and reset the computer; when prompted for disk B insert the disk containing a copy of the altered level.

If you have the Degas Elite art package you can edit all the graphics: disk A holds all the sprites and disk B all the level blocks in degas format.

Wizzball, Turbo ST and Spy v Spy can also be modified in a similar manner.

Format Health Warning: this applies to any disk that you try and modify. Make backups of the disk before altering it. If you can't or don't know how to then don't attempt the modifiications. It's your fault if you don't follow these instructions and consequently mess up your originals.

J Tranter
Wombourne, Wolverhampton

WIRED FOR SOUND

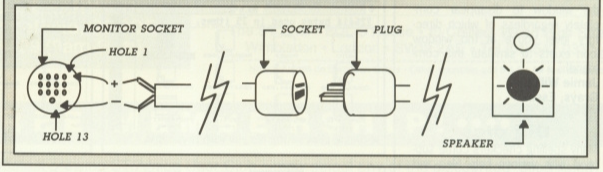
Admit it, the sound quality you get when connecting your ST to a television is dire. Using some wire and a speaker, sound output can be much healthier:

Pop down to your local electrical shop and buy some two-core wire and a speaker (if you haven't any lying around the house). Strip the cable so you have bare wire showing at each end. Insert one part of the wire into the top right hole of the monitor socket and the other into the very bottom hole (make sure the computer is switched off while you do this). At the other end, connect wire to speaker.

Now go about you usual ST business; clear sound should come drifting through the speaker.

Format Health Warning: take care that you insert wire into the correct holes. It is unlikely, but still possible, that you might ruin your ST. Your guarantee will be invalidated if you carry out this project.

Sean Relph
Penrith, Cumbria



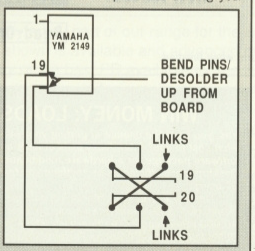
BOOTING FROM B

To allow the Atari to boot from an external Megabyte drive, remove the motherboard's casing and desolder – from the circuit board – pins 19 and 20 of the Yamaha YM2149 sound chip. Connect the pins to a double pole, double throw switch as shown in the diagram.

The links are used to confuse the computer into thinking your external drive is A.

Format Health Warning: under no circumstances carry out this modification if you haven't used a soldering iron, don't wish to lose your warranty and aren't 100% confident of your ability to perform such an operation. If you go ahead with this project and wreck your ST, you are to blame. Not us.

Mr JR Mason
Crosby, Liverpool



Files from BBCs

This short routine writen with Computer Concepts' Fast BASIC will send BBC BASIC files via RS423/RS232 to the ST. Choose 19200 baud with CTS/RTS handshaking. For pinout specifications consult page 81 of the ST Owner's Manual and pages 406/7 of the BBC User Guide.

Program the BBC's function key f9 thus: `fKEY 9 *FX3,5*FX8,8*FX7,8L.*FX3,4.` When pressed, this will list a BBC BASIC program to the ST. Alternatively you can print data to the ST by issuing `*FX7,8, *FX8,8` and `*FX5,2.`

On the ST side simply type in and run the Fast BASIC program below. It will capture a BBC BASIC listing and write it to disk.

```
IF INPSTAT(1)=FALSE THEN
   PRINT"NO INCOMING
   DATA":END
outfile%=OPENOUT "FROM-
   BEEB.BSC"
ON ERROR CLOSE# out-
   file%:PRINT ERR$:END
byte$=""
REPEAT
   prev$=byte$
   byte$=CHR$(INP(1))
   IF prev$=" " AND
      byte$=" " THEN
      PTR# outfile%=PTR#
      outfile%-1
   PRINT byte$;
   PRINT# outfile%,byte$
UNTIL INPSTAT(1)=FALSE
CLOSE# outfile%
END
```

Dave Henniker
Edinburgh, Scotland

Autofiring stick friction

Often an ST will start to misbehave for no apparent reason. Typically the machine might refuse to drop menus, reject most keyboard input and even stop loading files correctly. If you've got an autofire joystick plugged in, and it is merrily autofiring away, then take it out or switch off this option. The computer receives a barrage of rapid input from the joystick and has consequently has difficulty acknowledging any other commands.

Jamie Williams
Grays, Essex

To close or to close window

File, located on the menu bar, has two very similar commands: CLOSE and CLOSE WINDOW. The first, CLOSE, duplicates the top-left icon of an active window; basically it moves up one directory level (moves out of the current folder if you like) or closes the window if the root directory is active. CLOSE WINDOW causes the window to disappear completely regardless of which directory level you're at (no window icon exists to simulate this command).

Jamie Williams
Grays, Essex

Big dics

Many spelling checkers come supplied with various help files and other utility programs all jostling for space on one disk. This has the unfortunate effect of reducing the spelling checker's usefulness as user dictionaries can never grow to full capacity. Simple solution: copy the dictionaries onto a blank disk. This will let them grow unhindered.

Jamie Williams
Grays, Essex

Cadbury's caramel cursor keys

If you're using the Alternate-cursor key combination to emulate mouse movements, try holding down [Shift] at the same instance. You'll find that the pointer moves in smooth pixel increments.

Karl Wilson
Whitehaven, Cumbria

Bios discovery

The device code for the GEM BIOS call BCONOUT (trap #13, function #3), according to Glentop's reference guide, should be between 0 and 4. However, if 5 is used, the output device chosen is the screen which enables the full Atari character set to be displayed, and not just ASCII symbols.

```
BCONOUT  char.W  #0-255
;character to be sent
         dev.W   #0-5
;device code
         func.W  #3
;output character to
device
         trap    #13
         addq.L  #6
```

Martin Prcychodny
Orton, Peterborough

BEGINNER'S CORNER

FILE NAMES

If you have investigated the contents of disks, you will have probably noticed that files consists of a maximum eight-character name, a full stop and a possible further three-character extension. The three-character extension can tell you a lot about a file:
DOC – usually a help file which contains information about a program or disk.
PRG – a GEM program file. Double clicking on this causes the program to start.
TOS – a Tramiel Operating System file. That is, a program that doesn't make use of the WIMP environment. Double clicking on a file with this extension causes it to start.
TTP – TOS takes parameters file that does just that. Clicking on this type of file results in a message asking you to enter some information for the program to use.
ACC – an accesory file. These can't be run in the usual way; the auto load at boot time if present in the root directory (see last issue).
RSC – resource files which contain box and alert information. Of no use to you generally.
BAS – BASIC files as used by ST BASIC.

Double clicking on any file with an extension other than TOS, PRG or TTP will cause a window to pop up asking you to Show, Print or Cancel. Show will display the contents of the file on screen, Print sends the file to printer and Cancel takes you back to the Desktop.

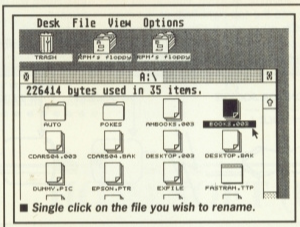
DELETING FILES

Dangerous operation this if used unwittingly. To delete a file, select and drag the required file or files to the trash icon and dump them there. A prompt will appear asking you to confirm the deletes. Click on OK if you are positive you don't mind losing the file. Remember, once you trash something, it is gone forever.

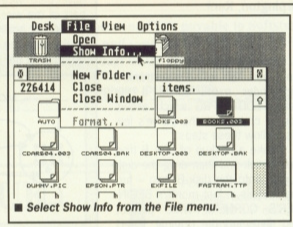
RENAMING FILES

Select a file by single clicking on it and point a File on the menu bar. Select Show Info from the resulting menu. A dialog box will appear containing the current name of the file, its size in bytes, the time it was last modified and its attributes (read/write status).

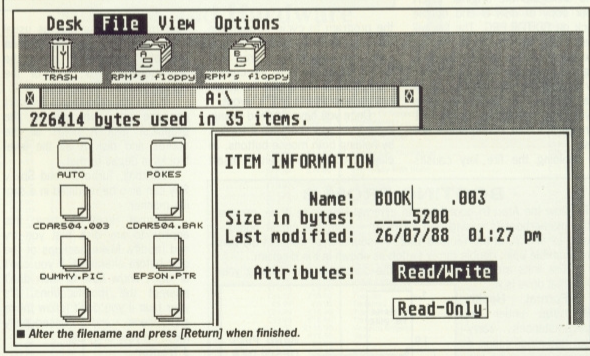
Change the name by pressing [Delete] or [Esc] and then typing in the new name. Filenames can be up to eight characters, optionally followed by a full stop and a three character extension. Be very careful not to change the three-character extension as you might not be able to run the file again. Press [Return] or click on Ok when finished.



■ *Single click on the file you wish to rename.*



■ *Select Show Info from the File menu.*



■ *Alter the filename and press [Return] when finished.*

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CU TIPS WORKBENCH

Mystified by the manuals? Flummoxed by the files? A pair of pages to aid Amiga owners in their struggle against visits from the dreaded Guru. This month's £30 prizewinner is John N. Blooars for his multi-coloured tip on enhancing the look of text files on screen.

Multicoloured bobs

If you're a BASIC programmer and you're interested in getting the most out of the Amiga's graphics system, you've probably experimented with Sprites and Bobs. Amiga BASIC comes with a utility called the 'Object Editor' to help you design these handy little devils.

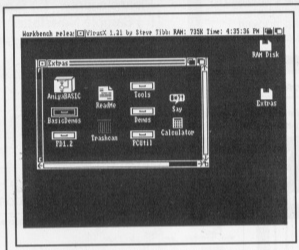
The standard version of the Object Editor only allows you 4 colours on screen at once. It is possible to get 8 or even 16 colours though, depending on the amount of memory you have. With 256K you can only use 4, fitting all Amigas, including early 1000s. With an A500 you can certainly get 8 colours screens, and maybe 16 if you're lucky.

What you have to do is edit the Object Editor program, which is itself written in Amiga BASIC, to remove the comment markers from a few vital lines so the program actually runs them. The extra colours only apply to Bobs, not Sprites, which are limited to four colours anyway.

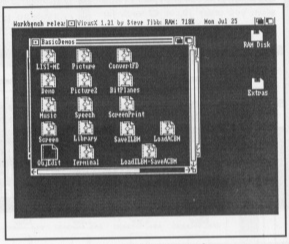
If you've got more RAM, you could try upping the colour content of Bobs to 16. As well as uncommenting the lines as shown in stage 5, change the line `Depth=3` to `Depth=4`. This gives you 4 bit-planes, hence 16 colours. Be warned though that if the Object Editor runs out of memory on account of there being too many bit planes, your Amiga will crash!

Hidden pictures and music

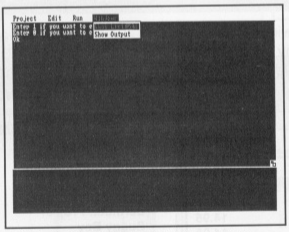
If you got your Amiga from the Silica Shop, it's likely that you have 10 PD (Public Domain) disks as well. On PD disk 8 there are some hidden pics, and you can find them by pressing certain keys while the slide show program is



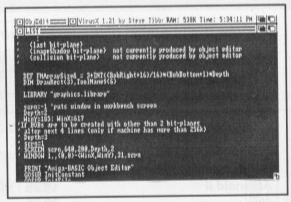
■ *1 – Put the 'Extras' disk in the drive and open up the 'BasicDemos' drawer.*



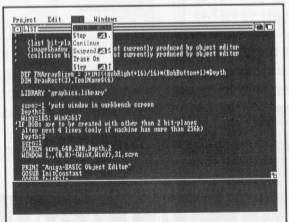
■ *2 – Double-click on 'ObjEdit' to run it*



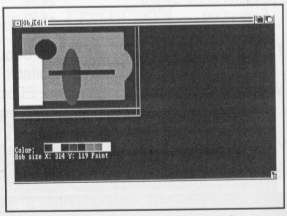
■ *3 – AmigaBASIC starts up, and the program begins to run. Press [Ctrl]C to interrupt it, then choose 'Show List' from the 'Windows' menu.*



■ *4 – Resize the list window so you can see it all, press [Shift]-cursor down to scroll the editor one screen down, and you'll see six lines beginning 'If BOBs are to be created...' with quote marks before them.*



■ *5 – Remove the quote marks from the bottom four lines, and choose 'Start' from the 'Run' menu.*



■ *6 – Once you're into the program, type '0' to select Bob rather than Sprite editing, and you'll see the colour palette at the bottom of the screen now has eight colours.*

running. Almost every letter from A to Z has a picture for it – there are about twice as many images as you would see if you let the slide show run normally.

Also, if you have DMCS (Deluxe Music Constructor Set) and wish to use the sound effects on PD disk 4 then try this: Load DMCS, pull down the Measures menu and go to SET INSTRUMENT. A window will appear. Clear the two boxes at the bottom by clicking in them and deleting any text. Insert PD disk 4 in drive 0, click on the box which says DF0:, and a directory of the disk will come up in the window. Go to the bottom of the list and click on 'Sounds (Dir)'. The sounds will appear by name on the screen – click on the one you want – say, YELL – and use this as a new instrument.

Some effects are great, but some can drive you up the wall!

Andrew Rispoli
Barnet, Herts.

Those messages!

It seems to be almost common knowledge that the original developers of the Amiga – the Amiga Corporation Inc – left some hidden messages in the system software when they sold it on to Commodore.

Just in case you get the urge to see these scurrilous notes, here's what you have to do:

Boot your Amiga up so you get to the Workbench screen. Click the pointer anywhere in the screen just to make sure it is active – the amount of free memory shows in the title bar. Hold down both [Shift] keys and both [Alt] keys at once. Press each function key in turn and you will see credits for the designers appear in the title bar.

Now for the sting: you might need the aid of a third hand for this one! With the four [Shift] and [Alt] keys still held down, hold down [F1] and eject the Workbench disk from the drive. Keeping all five keys pressed, put a *different* disk back in the drive and you will see a message which Commodore will probably remove from future releases of Workbench!

Stephen Knight
St. Martin, Jersey

More fonts

If you've managed to acquire a disk with some extra Amiga fonts on it, maybe from the Public Domain or from a commercial package with a surplus of fonts, you may experience difficulties getting some programs to recognise the new character sets. This is because when the Amiga tries to load its fonts it always looks in the 'logical device' called FONTS:, which in practice means the directory FONTS on the disk you booted the machine with.

You can, however, make it look elsewhere for its fonts. For the sake of example, suppose that your new fonts are in a directory called NEWFONTS on a disk called MYDISK (you can see what a disk's name is by looking under its icon on the Workbench screen). Before you run a program – whether it's normally run from the Workbench or the CLI – open up a CLI window and type at the command prompt (see issue 1 for detail of how to open up a CLI window, if you aren't sure).

```
ASSIGN FONTS:
MYDISK:NEWFONTS
```

Now you can close the CLI if you want to and run a program which uses fonts as normal by clicking on its icon – this certainly works with Deluxe Paint, as an example. When you choose the load fonts option from the relevant menu you will be asked to insert MYDISK in the drive and your new fonts will then be listed.

SOUPED-UP TEXT FILES

If you're writing a text file to appear on the screen, for example as a set of instructions for someone to use your program, there is a lot you can do to make the presentation a bit snappier.

The trick is to embed 'ANSI codes' in your text. These are special codes which, when the Amiga's screen controller reads them, cause the following text to be printed in bold, italic, underlined, or a different colour. The raw information you need is hidden in the rather terse Appendix D, 'Printer Escape Codes', at the back of the ordinary Amiga manual.

You will see that this appendix takes the form of a table of lines like `aSGR1 ESC[1m boldface on.` Ignore the first column headed 'Label'; the important information is that Escape [1m is the turn-on-bold command.

There are several ways to use these codes. The most straightforward is with ECHO commands in an Execute file. Using ED, or any text editor you want, create a file called FRED containing the line:

```
ECHO "Here is some
*e[1mbold text"
```

Now when you run this file by typing `EXECUTE FRED` at the CLI you will get 'Here is some **bold text**' appearing on the screen. The characters `*e` are treated as 'Escape' by the ECHO command, so `*e[1m` in the string is equivalent to the ANSI 'bold-on' command. In the screen shot shown you will see quite an involved set of commands to switch colours, underline and so on.

Here is a list of the most useful ANSI escape commands. Note that not all the commands in appendix D actually work – most are intended for use with printers rather than the screen, so things like 1/8" line spacing have no meaning:

ESCc	Clear the screen
ESC[3m	Italics on
ESC[23m	Italics off
ESC[4m	Underline on
ESC[24m	Underline off
ESC[1m	Bold on
ESC[22m	Bold off
ESC[A	Cursor up
ESC[B	Cursor down
ESC[C	Cursor right
ESC[D	Cursor left
ESC[30m	Blue text *
ESC[31m	White text *
ESC[32m	Black text *
ESC[33m	Orange text *
ESC[40m	Blue background *
ESC[41m	White background *
ESC[42m	Black background *
ESC[43m	Orange background *
ESC[0m	Revert to normal settings – this cancels any bold, italics, special colours, etc.

(* Colours assume standard Preferences settings)

For ESC, type `*e` when using the ECHO command. There are many ways other than by using ECHO to get text to the screen. Unfortunately the Amiga's standard text editors ED and EDIT don't allow you to put escape codes directly into files. You could use the COPY command to create a text file with Escape codes: at the CLI prompt, type

```
COPY * TO FRED
```

(type text for file FRED here, pressing the [Esc] key for ESC in commands)

```
[Ctrl]\ to finish.
```

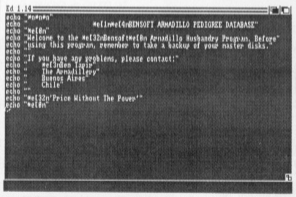
Then `TYPE FRED` produces the results for you.

Alternatively, if you are in a programming language like Amiga BASIC you can output text with the PRINT statement. Use CHR$(27) whenever an ESC code is called for:

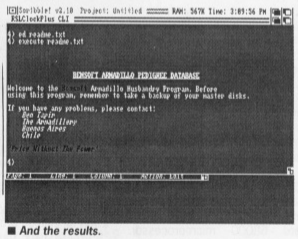
```
PRINT "Here is some";
CHR$(27);"[1mbold text"
```

has the same effect as the ECHO statement used earlier.

John N. Blooars
Cape Town, RSA



■ *ASCII codes embedded within ECHO commands. Don't forget to put a `ESC[0m` code at the end to reset the text to normal.*



■ *And the results.*

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GOLD DUST

Transatlantic secret agent Steve Gold brings news of Atari's new factory, transputers, Macintoshes and more for ST and Amiga.

Some good news for ST users who had difficulty buying their machines during the ST shortage earlier this year. Atari is negotiating for the purchase of a 350,000 square feet video games factory in Houston, Texas.

If the deal goes ahead – and its looks like it will – the Houston plant will ease the load on other Atari factories, thereby allowing increased ST production. For UK Atari consumers, this will improve supplies of the ST, which in turn will make for better discounts from dealers.

For those of you who already own an ST and aren't thinking of upgrading to a Mega, think again. US sources suggest that a 68030-based super-ST is on the way. The 68030-based machine is scheduled for a September/October launch in the US (*Hmmm – Ed*).

The super-ST is expected to be downwards compatible with the existing STs and, based on previous performance, there's every indication that the machine will be announced in the UK (though not released) at September's PC Show at Olympia.

Also on the horizon is a third-generation games console. The machine will be launched in January 1989 and feature an on-board 68000 microprocessor. The price will be $199, which equates to about £129 at current exchange rates. As readers will already have guessed, the games machine will probably be a stripped down 520STFM, minus keyboard and (possibly) disk drive.

Alternating currents

Over at Atari's US headquarters, an interesting undercurrent is developing between Neil Harris and Sam Tramiel. Harris left a message on Compuserve's Atari forum to the effect that Atari is revamping its US merchandising of the ST. Distributors are now apparently being left out in the cold, and the company is concentrating on employing sales reps in the field. Understandably, this message has caused concern among Atari users, many of whom rely on distributors for technical advice and back-up support when their dealers can't help them with their enquiries.

A week or so later, up pops Sam Tramiel, MD of Atari, saying he was "disappointed by the negative letters and articles regarding comments made by Neil Harris."

The consensus of opinion in the US Atari ST community is that users cannot expect much assistance from ST box-shifters and, if they want support, they will need to buy their machines from full-priced retailers. UK readers would do well to note this point, given the number of special offers on the ST which are currently being advertised.

Sac – the hit

Those Amiga users who've been looking jealously at David Small's *Magic Sac* Macintosh emulator for the ST will be pleased to know that he's now working on a Mac emulator for the Amiga. Unfortunately, Small is reported to have encountered a programming problem with the Amiga's memory map, with the result that initial versions of the Amiga Magic Sac for will almost certainly be limited to 256K Macintosh programs.

There isn't much Mac software that will run in a quarter Meg, so until Small or someone else conquers the memory map problem, it looks like a Magic Sac for the Amiga will only be of limited interest. Don't despair, though. Small says the memory problems only affect the A500 machine. As (and when) Commodore get around to increasing the Baby Amiga's system memory to 1Mb, and/or users start installing extra RAM on their machines, a workable Mac emulator for the Amiga becomes viable.

Taking a realistic view of things, it seems unlikely that Small will market a Magic Sac for the Amiga until 1Mb Amigas become available. A1000 owners will probably be disappointed when the Amiga Magic Sac finally appears, since their machines don't have the necessary circuitry to drive one megabit RAM chips.

■ ***An Apple Macintosh. Could the Amiga run its software soon?***

Software seen?

Manx Software, is about to release its long-awaited Aztec C68K source level debugging package for the Amiga. The $99 package should be available in the UK through a number of distributors by the time you read this.

Interestingly, although there are no current plans to release the Aztec debugger on machines other than the Amiga, Manx do say that the package will run on most other 68000-based micros. This could be a chance for budding technical types to port the package over to the Apple Macintosh or Atari ST environments.

Amiga owners with access to a modem will be interested to hear that Haitex, a new US software house, is alpha-testing a $99 communications package called *Amic-term*. Amic-term is provisionally scheduled for a very late '88/early '89 release and seems to be way ahead of any other Amiga comms software. Alpha-test features (which may be subject to change) include X, Y and Z Modem file transfers, as well as ASCII and Kermit facilities.

Also included in Amic-term's long list of features is a variety of terminal emulations, including TTY, VT52, VT102, and ANSI. In addition, the package includes a call logging facility, so you can check your phone bills when they come in. Amic-term also supports remote program facilities. Put simply, this means you can dial into your own (or somebody else's) modem-equipped Amiga, and run programs on that machine. The resultant text-mode screen display is then echoed down the phone line, as is data to and from the machine's screen, printer and/or disk drive. Amazing value at just $99. Look out for Amic-term in the imported software lists soon.

Putting the Abaq back

On the transputer front, the Abaq continues to attract interest in the US. Sources suggest there are currently 50 machines in general use with alpha-testers, and a further 200 were installed during July.

There are strong reports that the Abaq will be on sale on both sides of the Atlantic by the end of the year, although much rests on the work of Perihelion, the company responsible for the Abaq's multi-tasking operating system, Helios. A spokesman for Perihelion has been quoted in a trade paper as expecting Helios to be available by this October.

■ ***Atari's long-awaited Abaq. Shipment is being held up waiting for Perihelion to finish the operating system, Helios.***

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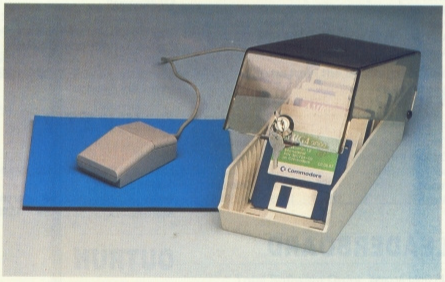

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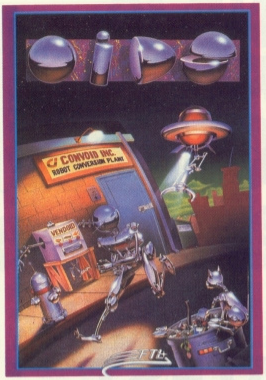

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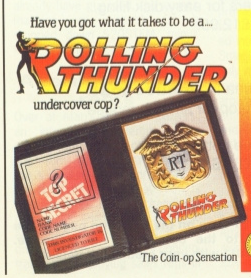

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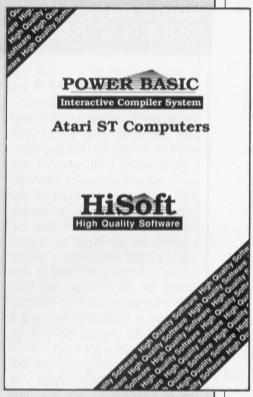

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Atari ST and Amiga • £29.95 (RRP £39.95)

This spreadsheet from Digita International has already established a reputation for itself on both the Amiga and the ST. We need say little more about Digicalc since not only have we reviewed it, but a demo of the ST program is included on the August issue cover disk – so here's your chance to really try before you buy!

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This is something else – Electronic Arts' graphics program which comes from the US with gushing, almost embarrassing, praise. You can paint on a 'canvas' that is bigger than the monitor screen – 1008 by 1024 pixels, with 32 colours in low resolution or 16 colours in high resolution. Full percentage colour mix is possible, including hue, saturation and contrast for each colour. Full zooming in is possible, with special animation effects including Colour Cycling which offers almost cartoon-like movement qualities. There's an unlimited variety of paint brushes you can use, a complete set of shape and line tools, and a range of special effects which will let you create banners, calendars, cards, newsflashes – anything can be done with a splurge of style which is the result of a program which really lets your imagination loose. **Try it – you won't be disappointed!**

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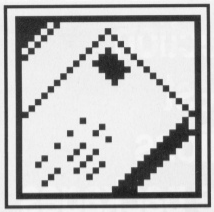


FORMAT LETTERS

It just keeps on growing. As our mail sack bulges, so the number of pages of your letters increases. All sorts of quandaries, queries and quips have been sent to: FORMAT LETTERS, ST AMIGA FORMAT, 4 QUEEN STREET, BATH BA1 1EJ. Why not send yours in, too?

Getting more from RAM

There are a couple of problems with the RAM disk utility from issue 1. Firstly the loading message is wrong as it assumes you are in medium res, which I am not. Also, it doesn't like most of my software to be run from inside the RAM disk. It is quite useful for copying though. While I'm here I might as well ask software writers to add a bit more flexibility to programs for the ST. Take the RAM disk program, it just tells you that you have a 200K RAM disk and if you want to change the size as well, sorry matey you can't.

Why don't programs use the Bios and XBios hook codes – it would save owners of the new ROM machines a lot of bother?

Jonathan Small
Bromley

■ *The RAM disk program is PD and we pass the code and documentation on (including instructions on changing the drive size) 'as is', which we're obliged to do. It doesn't take a lot to switch resolution from the preferences menu, though. Most games refuse to work from RAM disks as an anti-piracy measure, but many sapplications have options to configure their programs to work with a variety of drives.*

Printers on line

Could you have a survey on printers in your magazine? I wish to purchase a printer (hopefully a Star LC10) for my Amiga and I also want to use it on my dated C64. Is this possible and if so, do I need any extra leads?

How come that software for the Amiga is more expensive than that for the ST? When I purchased my C64 the software[1] was a few pounds dearer, now I have the same problem with my A500. For example, in your first issue Interceptor for the Amiga was £24.99 and Virus for the ST was £19.95. Surely if Commodore want to be No 1, then they should keep the prices closer together, to encourage higher sales.

J.J.Hocking
Truro, Cornwall

■ *We'll be looking at hardware add-ons during the coming months. You can use the Star printer with both machines, but you will need separate, plug-in, interface cartridges for each; a Centronics cartridge for the Amiga and a Commodore-specific one for the C64. You'll also need leads with the correct connections for each. This system of cartridges doesn't apply to all manufacturers, so check before you buy.*

It's not really fair to compare different games from different manufacturers. Although there's still some discrepancy between ST and Amiga prices, more and more are being released at the same prices. Commodore has very little control over the pricing of games from independent software houses.

ST to BBC

I have an Atari 520STFM and I am using a TV for the display, but want to use a monitor which has a BBC lead. I have seen advertisements for Phillips monitors with Atari leads and I was wondering if I could buy a lead like that and connect it to the BBC monitor, therefore using it with my Atari. If I can, would it be a better quality of picture?

Ben Deitch
Cardiff

■ *Assuming your monitor is the standard MicroVitec type supplied with most BBC Micros, it won't work with your ST as it needs TTL level RGB input and not the linear levels used by Atari. You would also lose any sound output from the ST, as the MicroVitec has no speaker.*

Q and A

I don't own a 16-bit computer (yet), but I am hoping to get an Amiga A500. I would be grateful if you could answer the following questions for me:

1. What is the 'Workbench' and what is 'CLI'?
2. What is the 'RAM disk'?
3. Why does the software for the Amiga and ST cost so much?
4. When you buy the Amiga, should you get the Workbench disk with the computer?

Fauzan Mirza
London

■ *Try these:*

1. The Workbench is the icon-based interface to the computer which uses Windows, Icons, Menus and a Pointer (a 'WIMP') to make working with the machine easier than having to learn a series of commands. The CLI ('Command Line Interface') lets you type in the commands that the Workbench tries to avoid, if you're determined to do things that way.

2. A RAM disk is an area of the Amiga's memory set aside to mimic a disk drive. It's particularly useful for copying files on single-drive micros, as it's a lot faster than a 'real' drive. The Amiga's RAM disk is particularly clever, as it expands and contracts automatically to store whatever you put into it.

3. Because you're comparing it with 8 bit home-computer prices. Compare it with business software on the IBM PC and it looks cheap.

4. Yes.

AT SCREENING POINT

I have only had my Amiga for about two months, and bought it to do my husband's accounts on. Unfortunately, I haven't had time to do them yet as I am too busy playing games on it (at least it's a good tax write off). Well, let's get to the problem; when I first bought my machine, I purchased *HitchHikers Guide to the Galaxy*. I am stuck, and after two months of desperately trying to figure it out I've decided to ask your expert advice (creep, creep). When you are on the *Heart of Gold* and everyone wanders off, what are you supposed to do? The door that Marvin keeps wandering off through will not let *me* through. I have begged, pleaded and told it that I am a Superior Being, all to no avail – so please, please tell me what to do.

Karen Smith
Gwynedd, Wales

■ *You're not going to like this, but the screening door's a red herring. Spend your time instead building an improbability drive. A nice cup of tea could help.*

C compiles and die!

Since my upgrade, last Nov, I have been buying every Amiga magazine that I could lay my hands on. When I saw your magazine with a free disk, (or is it a disk with a free mag?) for the same price, I thought, "Ah well, if the disk is of no use I can at least re-format it".

Surprise, surprise! Your magazine sure makes all the rest look like run of the mill nitty gritty. I am teaching myself to program in C, using Lattice C V4. Although most programs work, I still get into problems.

One of my problems is that the program compiles, links and then asks for default values on such and such 'stubs'. As I do not understand this, when the programs are run via the CLI, I have a requester telling me that I have a software error, and to stop all disk activity. Please help me!

Mr S.J.G.Reeves
Solihull

■ *We've come across this problem, too, and like you, are confused by it. Basically, you haven't got the correct libraries open when you link. If you use any floating point arithmetic or square roots and the like, you'll need to use an extra maths library, so that could be it. Instead of typing* `LC -L <file>`, *try* `LC -Lm <file>`.

Sounds good to me

I have owned an Atari 800XL for 2 years now, and recently 'upgraded' to an Atari ST. I was amazed when I saw the screen shots in Format and other magazines, and with a loan from my parents I purchased an ST. I was very upset at the way some of the games moved – in particular the scrolling on some games is very jerky (which it never was on the 800XL) and when there are several moving objects in the game it becomes very slow. Also, in your first issue I was very disappointed to read that the Amiga sound chip was far superior to the ST's. Do you think I should sell my ST and buy an Amiga (as it stands I would rather have kept to my old 800XL)?

Peter Busby
Welwyn Garden City

■ *I don't know which games you're running, but try* Return to Genesis *or* Goldrunner *to see examples of good ST scrolling. The graphical complexity of current 16 bit games is so much greater than anything on the 800XL that you're not really comparing like with like. Although the Amiga sound chip is more sophisticated, whether it's worth swapping machines for depends on the importance you attach to sound quality.*

Automating VirusX

I wonder if you could please help me: could you please tell me how to put VirusX into the startup sequence so that when you boot up your Amiga it is already there to start checking disks? I've looked through the Commodore manual only to find 10 lines of meaningless information.

Jamie Selby
Ripley

■ *First, make room on your Workbench disk for the VirusX program (delete the Demos folder if you like) and copy it into the top-level directory. Type* `ED S/STARTUP-SEQUENCE` *to run the text editor ED and load the startup sequence file into it. Add the line* `RUN VIRUSX` *to the end of this file and save the file and exit by pressing [Esc]X. Reboot the machine and VirusX will be installed. You will have to resize the CLI window which appears during boot-up though, as the VirusX task doesn't terminate and the window is left open. The Workbench screen is underneath the open CLI.*

Format Français

First I must tell you I am a French student, so I do apologise for the mistakes I will surely make.

I think *ST Amiga Format* is a really great magazine. The idea of a cover disk is wonderful. *ST Amiga Format* isn't too hard to understand, and very interesting. That's why I want to ask you this question: What have I to do to get *ST Amiga Format* in France?

M Chavaniez
France

■ *Write to our subscriptions department at* The Old Barn, Somerton, Somerset TA11 7PY *or ring them on 0458 74011. They'll be happy to quote an overseas subscription rate.*

Sallying Forth

Under the 'Getting Going' language list in issue 1, whatever happened to Forth? I suppose your choice is formed by whatever articles you read at the time you start, but I got the general impression that 'Forth was best' because:

a) it's easiest – you can see if it's going to work out, debugging as you go along (unlike C, where I understand you don't find out until the end!)

b) reasonable cost – cheaper than many BASICs and C's (including books) that I've seen. Very easy-to-follow literature too, I have 2 marvellous books.

c) more compact and faster and more elegant than Basic

d) easier than Assembler

e) applicable to just about any pur-

MUSICAL CHAIRS

In sequence

I am at the moment toying with the idea of buying an Atari ST. My main aim is to use it for MIDI music, and therefore I would appreciate any information you have on MIDI sequencer software. I want something decent but not too pricey or spectacular – I would never make use of the 24 track Steinberg software. Ideally, I would like a program for the 520ST and one with not more than 16 tracks.

N.Ingle
Witham

■ *Have a look at the* Microdeal Super Conductor *or the* Hybrid Arts Easy-Score, *both around the £50 mark.*

Hitting the buffers

I have made great use of *Aegis Sonix 2.0* software when I am composing on my Amiga 1000. I am quite pleased with the results so far but there are problems and despite writing to this American company twice I have received no reply.

I am using a Yamaha DX100 on all four MIDI channels but when I ask it to change patches on a long composition I get the message 'MIDI BUFFER FULL' on the DX100 display. I have tried everything to get around this but with no success. I can make it change patches on short test pieces ad nauseum but it will not work on proper songs. I am of course setting all 4 MIDI channels to the same channel and patch as the synth is not multi-timbral.

Ian Morton
Uxbridge

■ *Perhaps we're missing something, but we can't see any reason for running a mono-timbral instrument from 4 MIDI channels – surely one would be sufficient, and might not confuse MIDI so much. The 'MIDI BUFFER FULL' message is not uncommon on MIDI setups, and reflects the fact that the transfer rate for MIDI packets is not fast enough to keep up with the data when complicated patches are being used.*

MIDI muddle

I have recently become involved in a music application with a few friends. So I thought, MIDI! now I can utilise my potential as a recording sequencing etc maestro. However, I could not realise my (and my ST's) potential since all MIDI information tends not to answer some obvious questions. For example, supposing you have software that will function in conjunction with your computer as an 8 track mixing deck. How long a track can one disk hold? How do you record to tape, for playback? Software shop assistants are not much help either, so in desperation my friends gave up and purchased the Amstrad four track recording studio. So lads any advice?

On to criticism, why does everybody rave about *Carrier Command*? Sure the graphics are good and the idea is sound, but the game play is awful! Just a monotonous take-this-island-here, take-that-one-there etc. And you can't even speed things up in between travelling to and from islands. I feel that a potentially good game has been wasted by lack of foresight, on the part of its designers.

Mark Boulter
Kingston-upon-Thames

■ *I think you're confusing mixing and sequencing. A sequencer which can be used to play a sequence of notes with specific sounds, tempo etc is rather different from a mixer, which takes the audio outputs from several instruments and integrates them all together for recording or live performance. The former is easily and well handled with an ST or Amiga through MIDI. The latter isn't, and at the home entertainment end of the market the Amstrad 4 track is probably not a bad buy.*

'Tracks' and 'pieces of string' have similar lengths – the length of a track depends on the complexity of each note and how many instruments are playing on it.

pose; fast graphics, robotics etc.

Why doesn't everyone use Forth? Is there a snag I haven't come to yet? (You don't have to stick to 1K sections, and you can divide) – I often run Forth up first when I want a calculator quickly, though I have a desk accessory calculator, as the screen's more uncluttered and it's quick.

It only takes 3 or 4 goes before you have a mental picture of the stack popping up and down in your mind – it's easy! Sorry to go on but don't leave it out of your language features and program listings.

Norma Wrangham
Halstead

TIPS OFF

First, congratulations on your new magazine. It covers both the ST and Amiga without giving preference to one or the other, and with any luck you won't get too many 'My ST is better than your Amiga' letters in the letters page, or if you do, they'll at least be making constructive comments.

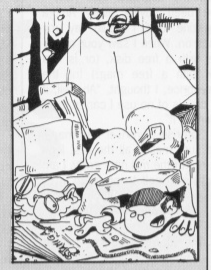
Just one major disappointment – no adventure section. We poor adventurers often have to make do with an odd page or two in a magazine but we fared even worse in Format.

I know you had 'Ten Brave New Worlds' and a few *Jinxter* tips in Game Busters, but that's another reason why I'm writing – the tips are wrong. If you cut the wire, you'll lose luck and won't be able to complete the game. And the clue about the miller applies to *Guild of Thieves*, Magnetic Scrolls' second adventure.

Sue Medley
Sidcup

■ *Whoops, sorry about the tips. Adventure/role playing game coverage is under consideration.*

"Next time, we'll try it without the tip."



Full bag

On which machine (just out of interest) were the Icons used for the headings of the pages created, ST or Amiga, or was it another machine to save being accused of bias?

At the moment I am using a normal TV with my Atari STFM, which is inadequate for art work, as red and blue are very dominant colours and merge over other colours, making detail work practically impossible. I would like to get a monitor and wonder why Philips monitors are cheaper than Atari's own. Are they less reliable? Which monitor would be the best for graphic work?

Also, I'm thinking of getting a second drive. Is the one selling for £99.99 reliable? I want to change the internal drive for a 1 Mb drive, but the ones I have seen have tiny buttons at the right hand side of the drive. The one in the machine at the moment has a big button in the middle and the case is moulded around it, the question is if I buy an internal drive will it slot straight into the place of the old drive or will I have to cut a hole in the case to fit the drive reject button? Help!

I was wondering if it would be worth getting a chip upgrade? What will I be able to do with the upgrade? The only advantage I have seen is an Art package for 1 Meg only – it looks very sophisticated. Can you tell me of any more advantages of buying an upgrade, so I can tell if it would be worth it?

Adam Mayer
Hillbrow, Liss

■ *Wow, a fair list of queries! The Atari monitor is rather sharper than the Philips one (though maybe not £100 sharper!), but the Philips units can be connected to both Amiga and ST, so could serve a double purpose should you ever add an Amiga to your stable. The Philips monitors have no particular reliability problems of which we're aware.*

If you're going to buy a second drive, why not fit it externally? That way you get the extra capacity and have the increased flexibility of a twin-drive machine. An extra half megabyte of memory could be used as a RAM drive, speeding the operation of many packages which make heavy use of disks. Our icons are produced on an Apple Macintosh, as is the rest of every page.

A500 to PC

I am seriously considering purchasing an Amiga for home use, so could you please answer me one burning question. Is PC emulation only possible on the 2000 or is there a suitable package/expansion that will enable PC software to run on a 500? If not why not?

Steven Hawells
Port Talbot

■ *The 'Transformer' package, bundled with the A500 in Commodore's summer promotion, emulates a PC in software. It costs about £30.00 at discount prices. We intend to cover emulators for both machines in a forthcoming issue.*

Price plea

Here in Bodmin our nearest stockist is in St. Austell, 30-odd miles away, or it's sending to software houses, with the problem of buying a pig in the poke. In shops you can see what type of game you are buying, so it is important that magazines give a full picture of game and/or business programs, but please remember just because we have an Amiga, it does not mean we can afford £80-plus for software. However much it appeals, we can only buy those items of software which will not put us in debt for ever and a day.

Mr J.E.Trailing
Bodmin

■ *Point taken, but there are plenty of people using both machines professionally, who can. We'll continue to cover software at a wide variety of prices.*

It's impossible

Once upon a time, way back many eons ago (well, 1985 actually), I owned a Commodore 64. For that machine, at about the same time, there emerged a game that in my view at least, remains unparalleled in its high quality. It was the Dalai Lama of adventures, the bee's knees of Fighting Fantasy, the wasp's nipples of Dungeons and Dragons. It was in short, the entire erogenous zones of all apial culture as regards excitement, atmosphere and originality.

The game was part 1 in a series entitled *Alternative Reality* – a US Gold release distributed by Datasoft if my memory serves me better than my CBM 64's did. Yes, I can recall the many small hours I spent wandering in The City, a world disturbed only by the clink of swords in the Arena, the hammering of the blacksmith and my father snoring in the next room.

So I waited with baited breath for part 2: The Dungeon to arrive. But it was not forthcoming. What happened? Not a word, not even a rumour have I heard since. Your mission, *ST Amiga Format*, should you wish to accept it, is to diskover the evil force preventing the release of the remaining 6 alternative reality titles. Should you or any of your mission impossible software squad fail to report, I'll be very disappointed.

J Ashworth
Manchester

■ *Having eavesdropped on the evil-doers, using incredibly complex equipment based around egg-timers, telescopic ears and a Roger Ramjet (™) mask, Format has discovered that* AR: The City *is available NOW from Grandslam for £19.95, with* AR: The Dungeon *following in the new year. For further details, check out the back cover of issue 2 (don't let him know it was that easy – Ed).*

On the game

I enjoy programming my computer, as well as playing games. Up to now I have only learnt ST BASIC, but I am just starting Assembler. I used to program a Commodore 64 in both BASIC and machine code. I am 15 years old and was wondering how to start writing games for a living. Will I need to write a good game before I get a chance or will a software company take a look at my programming abilities in another way? Also, what are my chances of getting a job?

Paul Livesey
Stockport

■ *Your best bet, tough though it may be, is to write a game first. With that you can sell your knowledge and skills, as the software houses will have something to look at. If it's a good game, you may start earning royalties from that to fund the next (quite likely), or you may be taken on as a full-time employee (rather less likely).*

Strange but true

A point on armadillos. You may be interested to know the armadillo is capable of gulping in air. This makes it float, and in this way it can cross rivers.

Geoff Kitchener
Winchester

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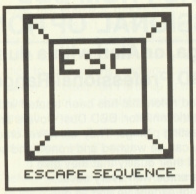


Winners galore

The closing date for our Epson laser competition came and went and 1500 hopefuls had their postcards, envelopes, bits of cardboard and papyrus scrolls thrown into the mighty Format tombola drum. We were surprised more people hadn't discovered the right answers, which were A – Desk Top Publishing, B – By depositing toner and B – The LQ 850. Roughly one in three entrants knew the right answers, with many people convinced the print sample was from the laser printer.

The first two correct answers out of the drum were R.Talbot of Colchester in Essex (who wins the GQ3500) and W.Pybus of Kettering in Northamptonshire (the LQ850).

The second competition in issue 1 was to dream up the real reasoning behind Arnor's strangely named QWXCL command in **Protext**. The two winners are A. Mason of Leicester for 'Question What are Xact Contents of Locations' and Trevor Cobbe of Leeds for 'Quick Wits Xcel in Computer Literacy'.

And finally the results of the **Prize Questionnaire draw**: there were over 600 returned, for which many thanks, and the first five fished from the tank were Mark Slater of Bedford, Paul Luxford of Horsham, Paul McMullen of Doncaster, Anthony Twist of Stourbridge and Colin Brown of Perth. £25 software vouchers will flap their ways to you as soon as we've printed them!

ST AMIGA FORMAT

Issue 4 of ST Amiga Format hits the streets on Thursday 15th September – order yours now, you know it makes sense.

Ami ou enemi ?

I guess we should think ourselves lucky. Commodore UK have been very helpful to us during and since the launch of *Format*. This would not seem to be the case with magazines across the channel – a rather miffed Bruce Lepper, editor of the new French magazine *A-news*, detailed the troubles his mag has had with Commodore France.

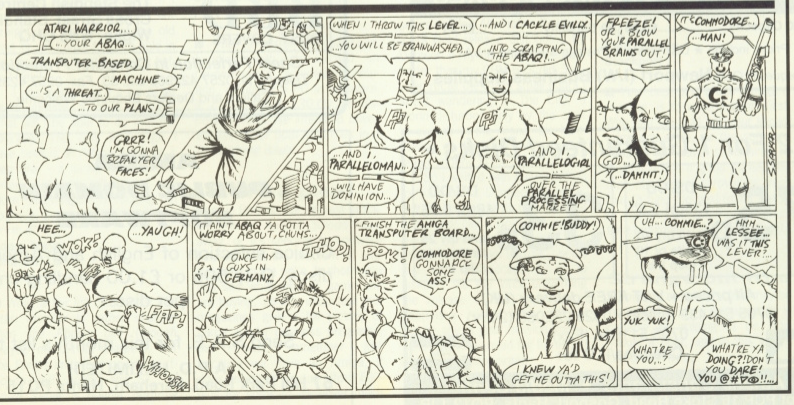
It seems that the new magazine is not favoured by Franke Lanne, French boss of Commodore, who feels the market is as yet 'too young' for a dedicated Amiga mag. Lanne has put the weight of Commodore behind a rival publication, and when he was unable to stop *A-news*, he withheld his company's press service (ie press releases and product announcements) and forbade them to use the words Amiga, Kickstart or Workbench on their front cover. This resulted in the rather peculiar cover line reproduced on this page.

We wish *A-news* well and hope they soon sort out their differences with Commodore. The company's approach seems an oddly negative way of publicising a micro.

■ *Citizen Printers recently ran a competition for schools in collaboration with the newly renamed Word Wide Fund for Nature (ex the World Wildlife Fund), with the prizes going to projects on dental health and the ecology of school playing fields. Unfortunately, being a rare hot day, a passing elephant at the prizegiving seems to have mistaken Rula Lenska for an ice cream.*

Superheroes, Inc.

by Sarkar



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